

MODERN CALIFORNIA HOUSES

CASE STUDY HOUSES 1945-1962

Esther McCoy

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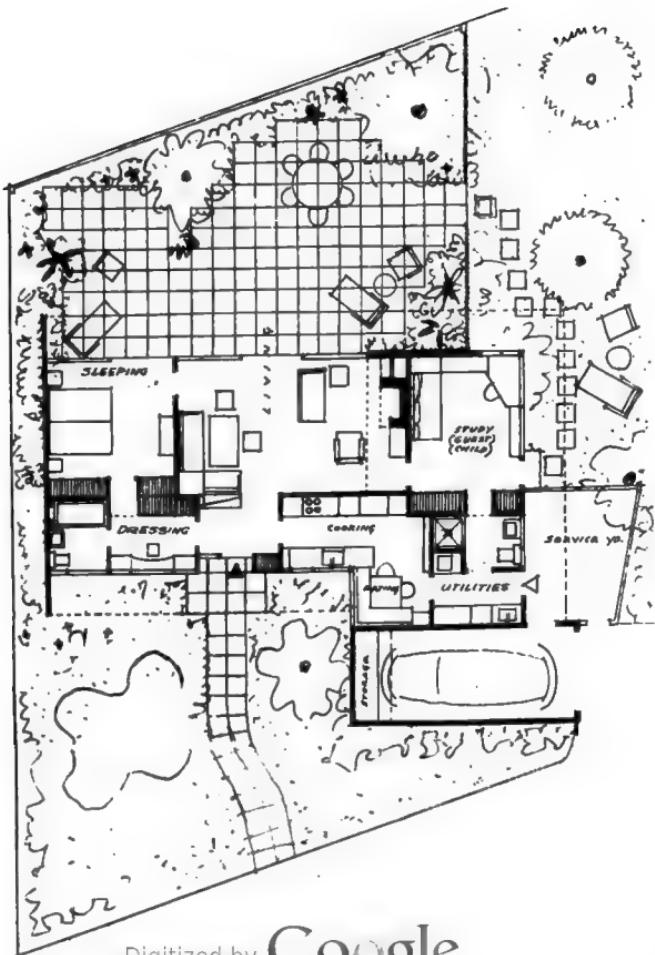
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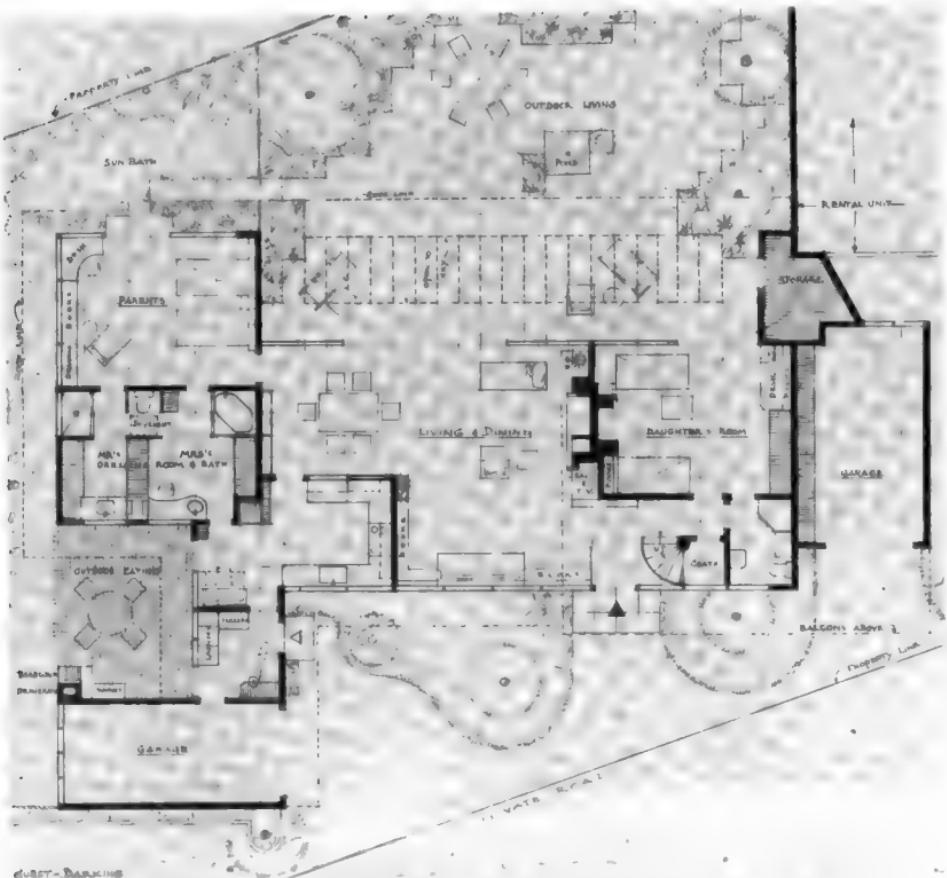


The indented front door is broadened by a glass panel; an entry way is formed by a book case with obscure glass above. Behind the glass is a dining area.

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Designer: J. R. Davidson

Project, 1945

Size of lot, 70 by 210 feet

Area of house: approx 1800 square feet

Two-story, studio apartment above

Six rooms, living-dining, kitchen, 2 bedrooms, 2 baths.

Studio apartment with bath

Material Plaster, wood frame



↑ →
10152 Toluca Lake Avenue North Hollywood

Size of lot 100 by 125 feet

Area of house 1650 square feet

Two-story, 5 rooms, living-dining, kitchen-breakfast-

laundry, 3 bedrooms, 2½ baths

Metal frame, wood frame

Original plan
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Perspective drawing. Problem: sun and privacy for a house and two later rental units on a 210-foot wide and 70-foot deep lot. Clients: a professional couple, a teen-age daughter and a mother-in-law. Solution: "I placed the houses diagonally across the lot and staggered them back. The couple leaves for work at the same time each morning so I gave them two dressing-bathrooms. The mother-in-law has an apartment with terrace on the second floor."



Perspective drawing—street view. A restudy of Davidson's 1945 two-story project; this one-story house has separate guest quarters under the same roof. A 7-foot wide passage divides the guest quarters from the house. The key to the plan is the screened service yard on the front which allows for a variety of private social gardens in the rear.

Six excellent early projects, not executed because they broke sharply with tradition, or would have been too costly to build, exercised, nevertheless, an enormous influence on future design.

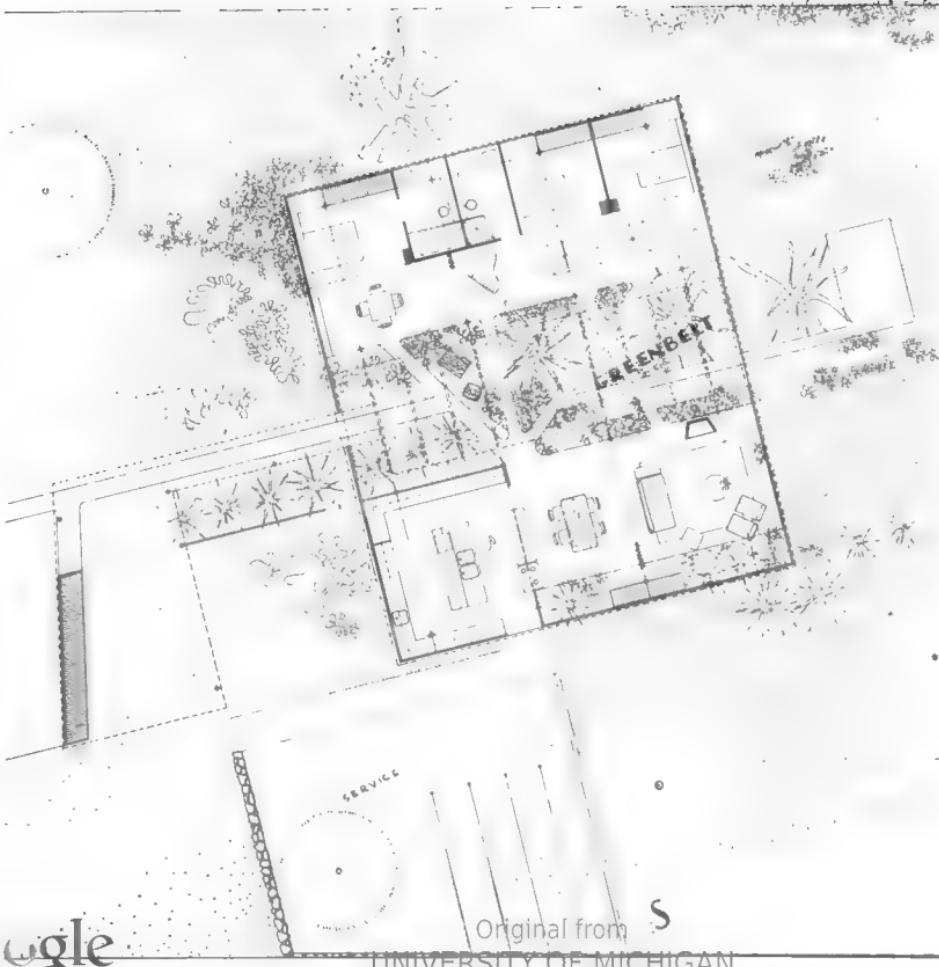
The first, Ralph Rapson's "Greenbelt" project, is strikingly contemporary in spirit after seventeen years. Designed in 1945 for a city lot in a built-up neighborhood, Rapson based his plan "on the premise that it must create its own environment—and it must look in rather than look out."⁵ This was accomplished by turning rooms with folding walls toward a large court roofed with wire glass—a focal point for all living functions, it was also the built-in view.

"The court was a place where children and adults might live and play in close association with nature," Rapson noted. "By creating a large inside grass and planting area, the artificial barrier between man and nature is dissolved. For once, the open plan will have been achieved; for once, the complete integration of inside and outside will have been accomplished."⁶

Light and heat in the court were controlled by adjustable louvres below the glass. The only solid partitions in the house enclosed bathrooms; all other walls could disappear.

The scheme reduced to a microcosm R. Buckminster Fuller's Autonomous Living Package with its artificial environment created under cover to shelter great numbers of people.

Unfortunately, the house was never built. But one young architectural student who studied the plans with care was Edward Killingsworth, whose interior courts are reminiscent of Greenbelt.



Architect: Ralph Rapson

Project, 1945

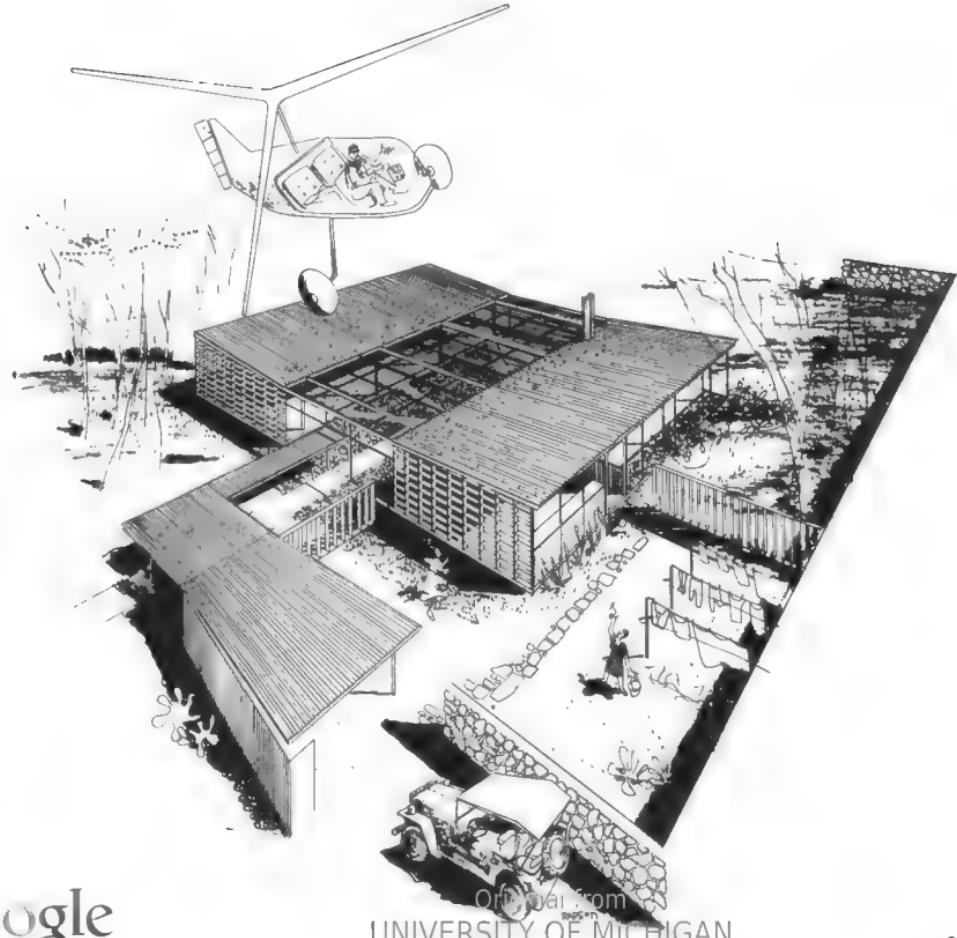
Hypothetical lot

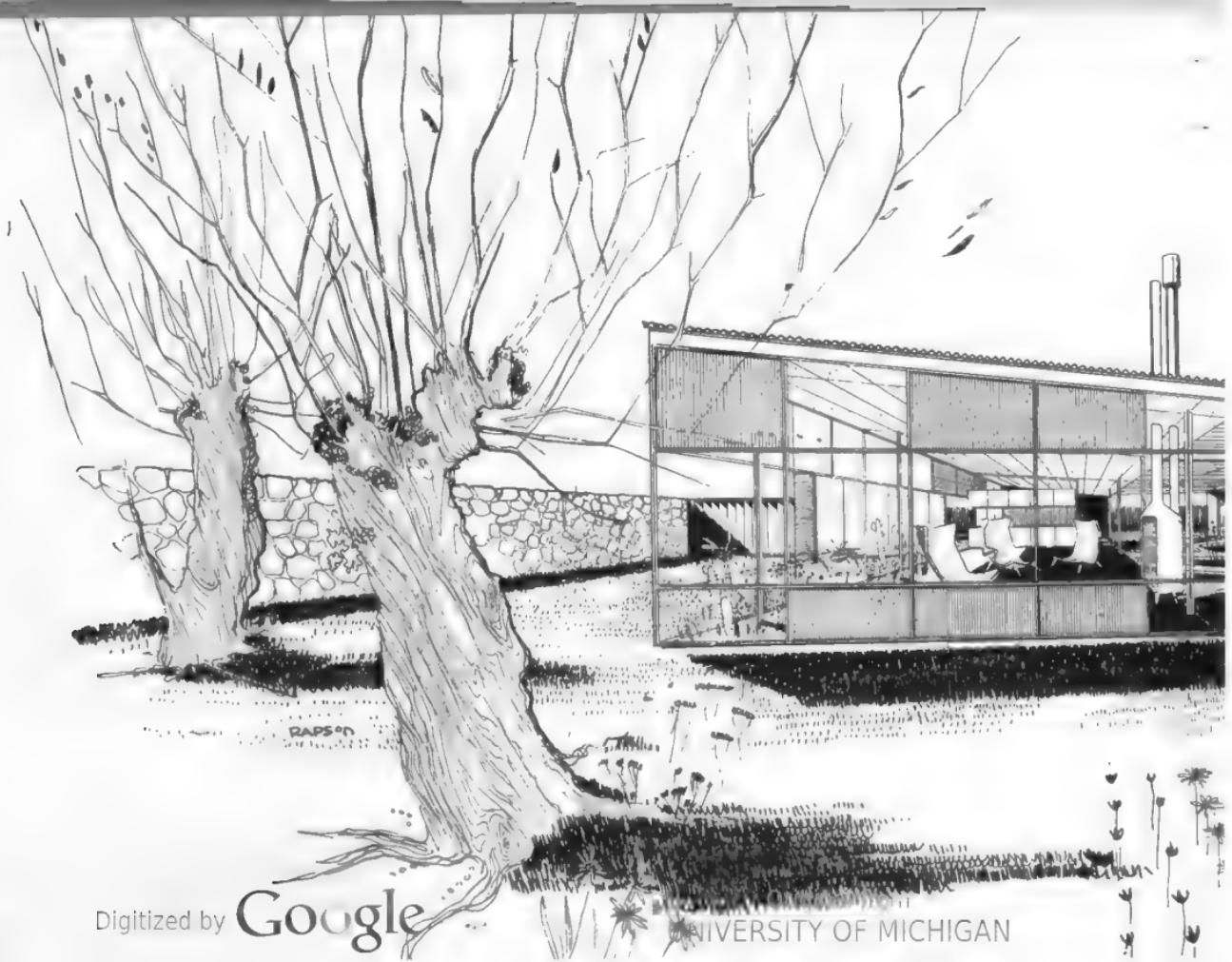
Area of house: approx. 1800 square feet including roofed
"greenbelt"

One story; 5 rooms: living-dining, kitchen, 3 bedrooms, 2 baths
Material: Wood or steel frame; standardized panels, not selected

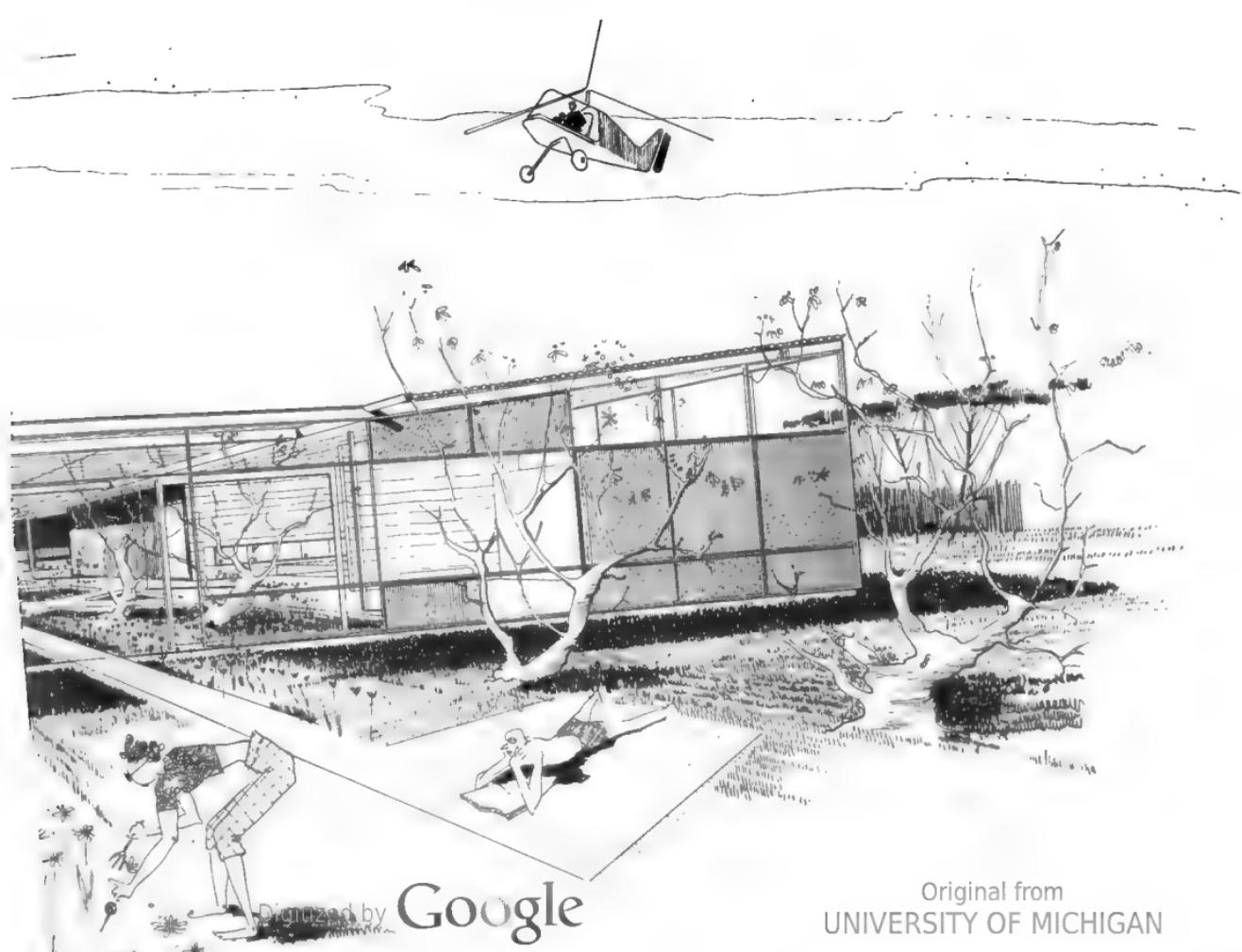
Perspective drawing. Ralph Rapson's prophetic Greenbelt House, with its prefabricated walls and glass-roofed interior garden—although never executed—had an enormous appeal to students and young architects. "It seems fundamental to bring nature within the house—not in small petty planting areas, but in a large scale that will do justice to nature," wrote Rapson of his in-looking plan (see next pages).

Perspective drawing—bedroom. The use of folding doors permits each sleeping area complete privacy or visual and physical enlargement of the entire enclosed space.





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Architect: Whitney R. Smith

Project, 1945

Size of lot: 94 by 138 feet

Area of house: 1800 square feet

One story; 5 rooms: Loggia-lounge-dining, kitchen,

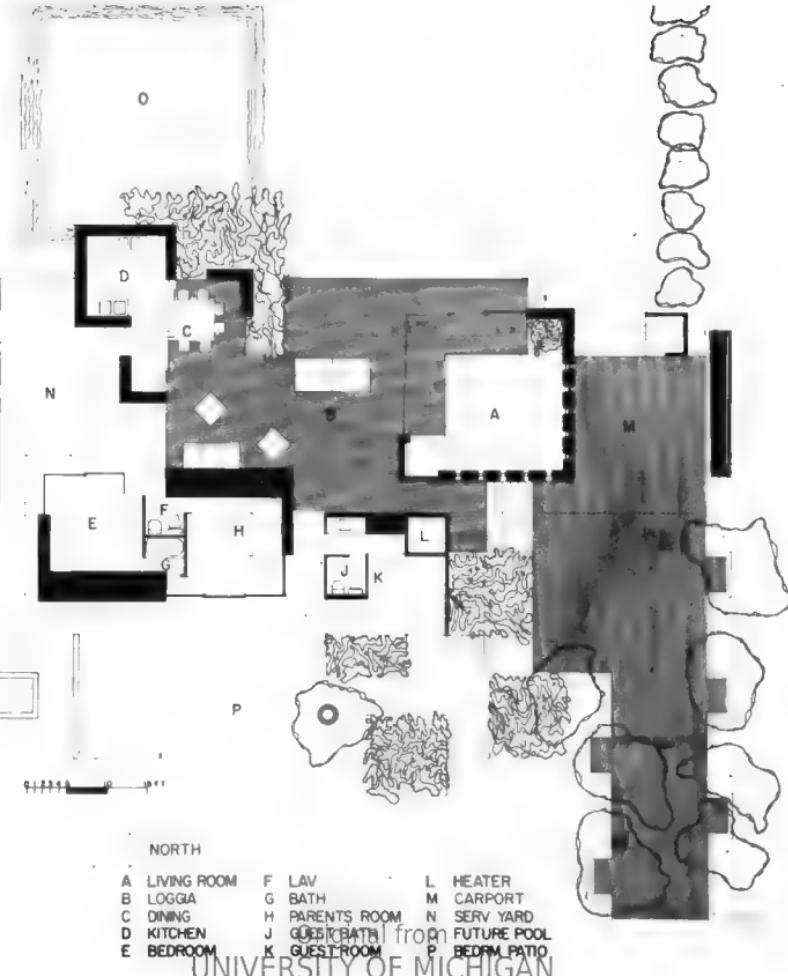
3 bedrooms, 2 baths

Material: Adobe brick set in steel frame

Two other Case Study projects, by Whitney Smith, both with in-turning plans, were equally prophetic. The 1945 "Loggia House" extended out to garden walls, with the front door a garden gate opened by a buzzer. (CSH #20,⁷ built in 1958, uses the same device.) The loggia was a central living area upon which smaller more intimate living spaces could be opened by sliding glass panels. Roller plastic screens changed the open loggia into a screened room. Smith called this solution "living islands under one roof."¹⁸

The exterior screen walls of adobe brick were set in a steel frame, combining lightness and strength of steel with the high insulation properties of adobe for warm Pasadena summers. (Adobe curtain walls of CSH #19 were also framed in steel.)

A second Smith project was a 1650-square foot house planned for a horticulturist: The entrance was through a lath house where specimen plants were displayed, and at the end of the living room a second lath house was raised several feet above floor level to bring the plants into view. It was a pity that a plan incorporating such simple structures as lath houses into architecture was not fulfilled; however, the idea was not lost, as Smith worked it into a later design.





Perspective drawing—view of the garden side. The central loggia separates lounge (left) from dining area. "The Loggia House is a pattern of shelter and space which turns inward upon itself. It anticipates the possibility and hope for introspective living within the present mania metropolitan," Smith observed in 1944.

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Architect: Whitney R. Smith

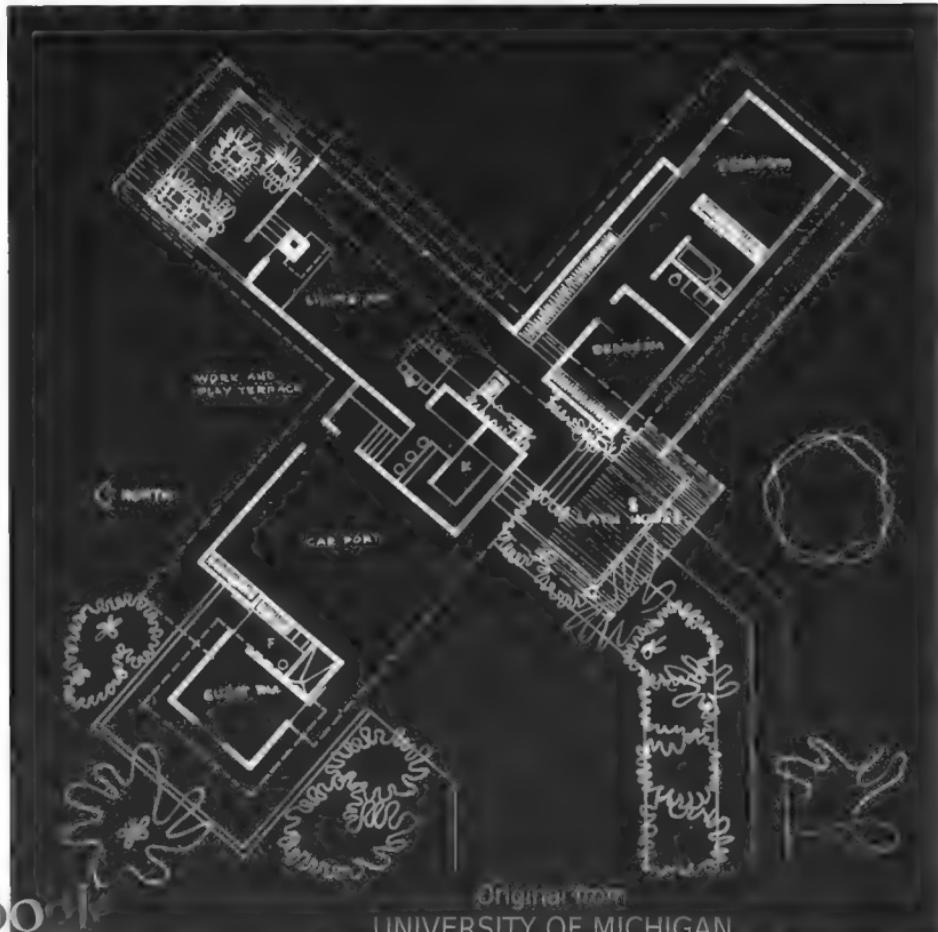
Project, 1946

Size of lot: 95 by 134 feet

Area of house: 1650 square feet

One story; 5 rooms: living-dining, kitchen, 3 bedrooms,
2½ baths (lath houses not included)

Material: plaster, wood frame; lath houses



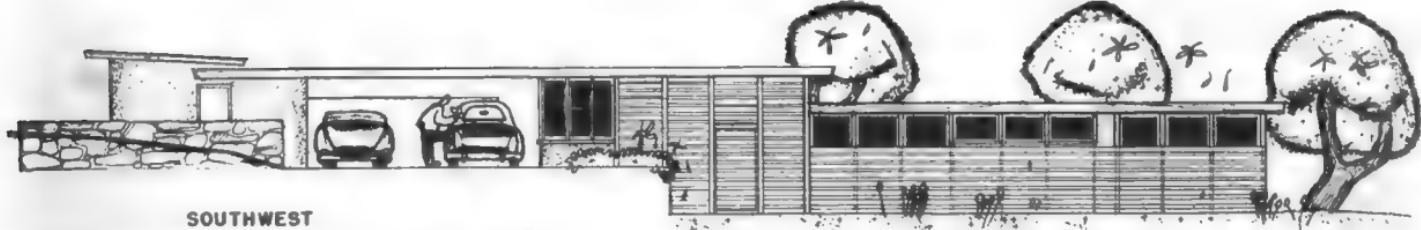
In one diagonal of Whitney R. Smith's X-shaped floor plan were a lath house, living room, dining space, and entrance hall adjoining a second lath house; bedrooms and carport were in the other diagonal. Plants in the lath houses may be easily painted in the living room.



NORTHEAST



NORTHWEST



SOUTHWEST

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Architect: Richard J. Neutra

Project, 1945

Size of lot: $\frac{1}{2}$ acre

Area of house: approx. 1800 square feet

One story; 6 rooms: living, dining, kitchen, 3 bedrooms, 2 baths

Material: corrugated cemento panels over wood frame

Three more unexecuted designs were by Richard Neutra. A 1945 one had a cross-shaped plan in which gardens zoned (a popular 1945 word) for different uses cut into living and sleeping spaces. It was a masterly plan, perfectly suited to California, and is still valid. The site planning of two projected houses (1946 and 1947) on adjoining lots of moderate size were staggered to develop private garden spaces and to create a community green, a solution which carried advice to numerous later site planners. Neutra's talent for placing houses in relation to one another, which is rooted in an equal love for park-like spaces and small private gardens, had already matured in the 1942 Channel Heights Federal Housing Project, in which he grouped houses loosely on rolling land to look out upon a sweep of park. That the 75-foot lot was not an island unto itself was one of the great lessons Neutra had to teach.

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Perspective drawing. Sports court at left is divided from social court by parent's bedroom wing.

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Living room - A social court with fireplace extending out from living room is one of four locations that cut into the plan.



Go .gle

Architect: Richard J. Neutra

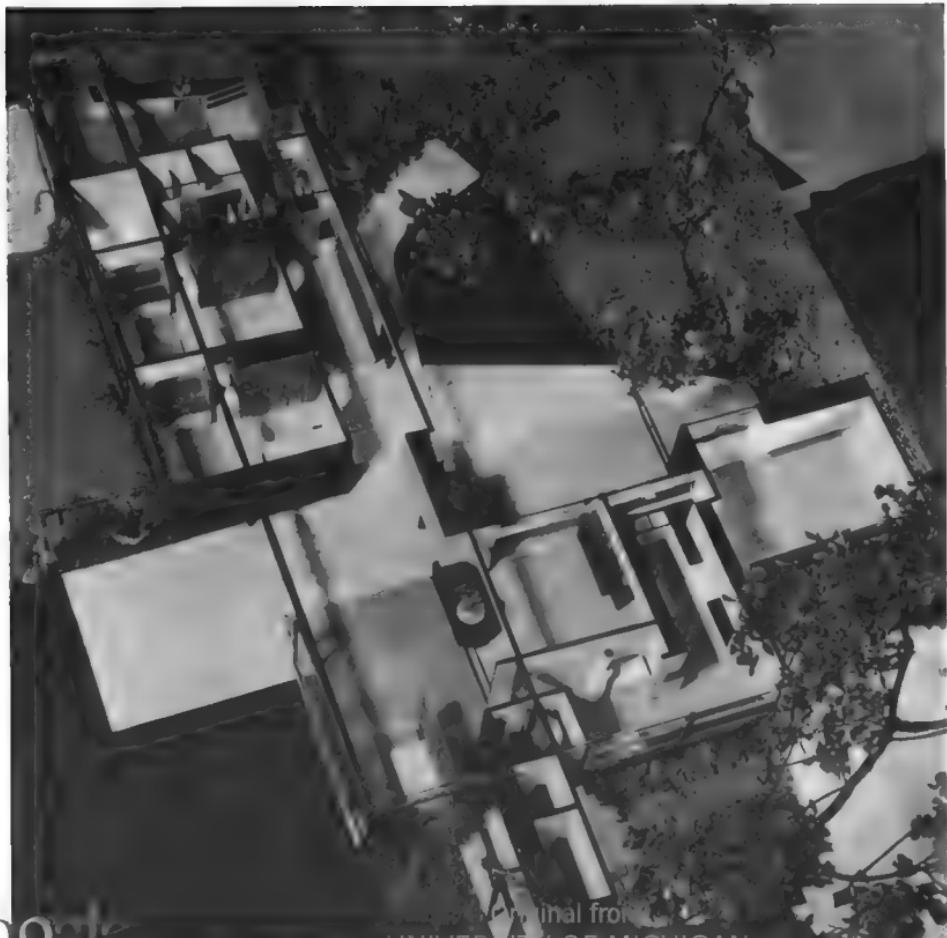
Project, 1946

Size of lot: $\frac{1}{4}$ acre

Area of house: approx. 1800 square feet

One story; 5 rooms: living-dining, kitchen, 3 bedrooms

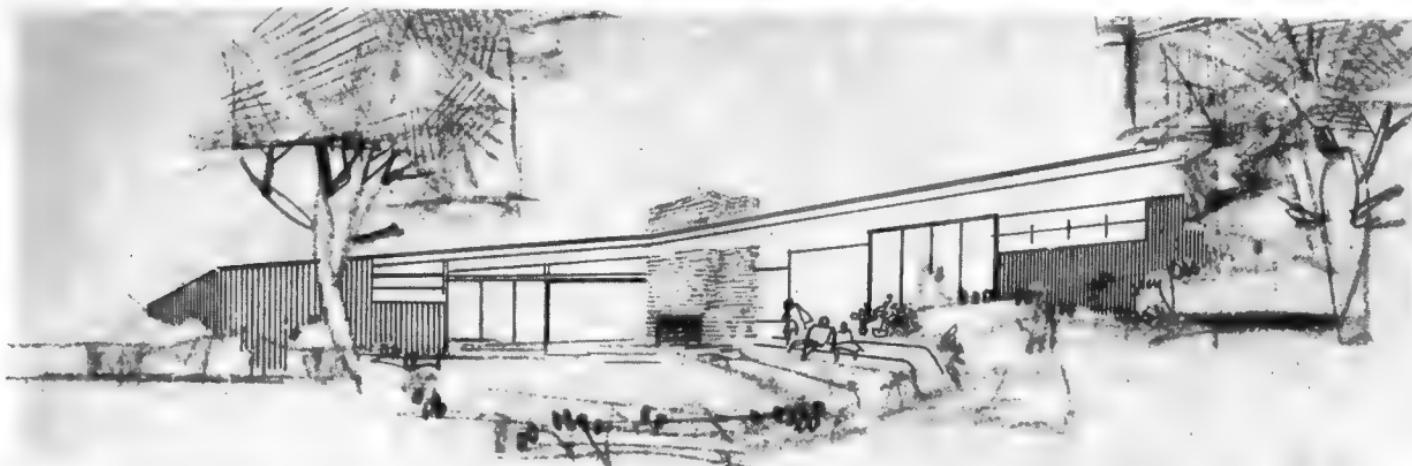
Material: not selected



Aerial view of model from the southwest. Perspective drawings (opposite) show the play and picnic patio (top), and living quarters and dining bay (bottom) which form an continuous shade and extend into the patios.

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Architect: Richard J. Neutra

Project, 1947

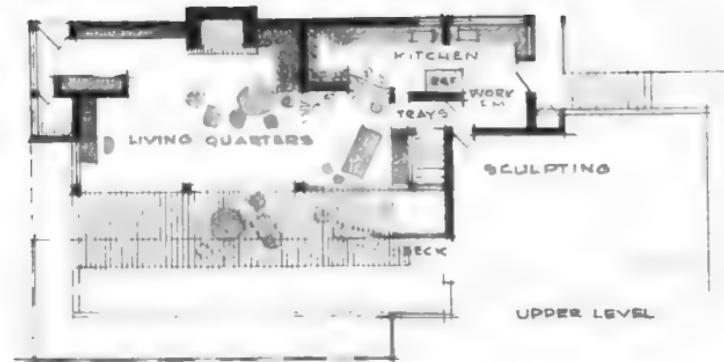
Size of lot: $\frac{1}{2}$ acre

Area of house: approx. 2000 square feet

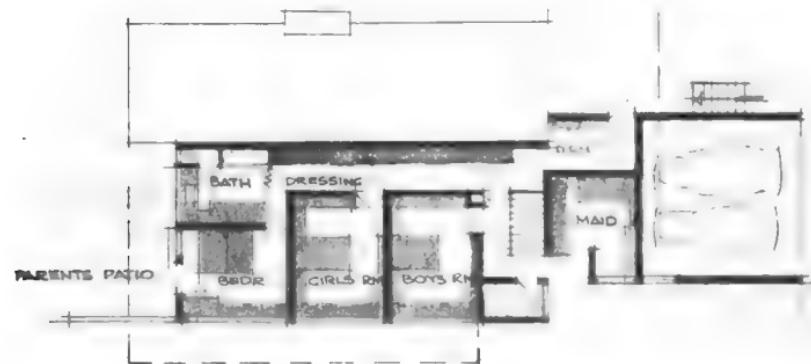
Split level; 7 rooms: living-dining, kitchen, workroom, 4 bedrooms

Material: not selected

YARD



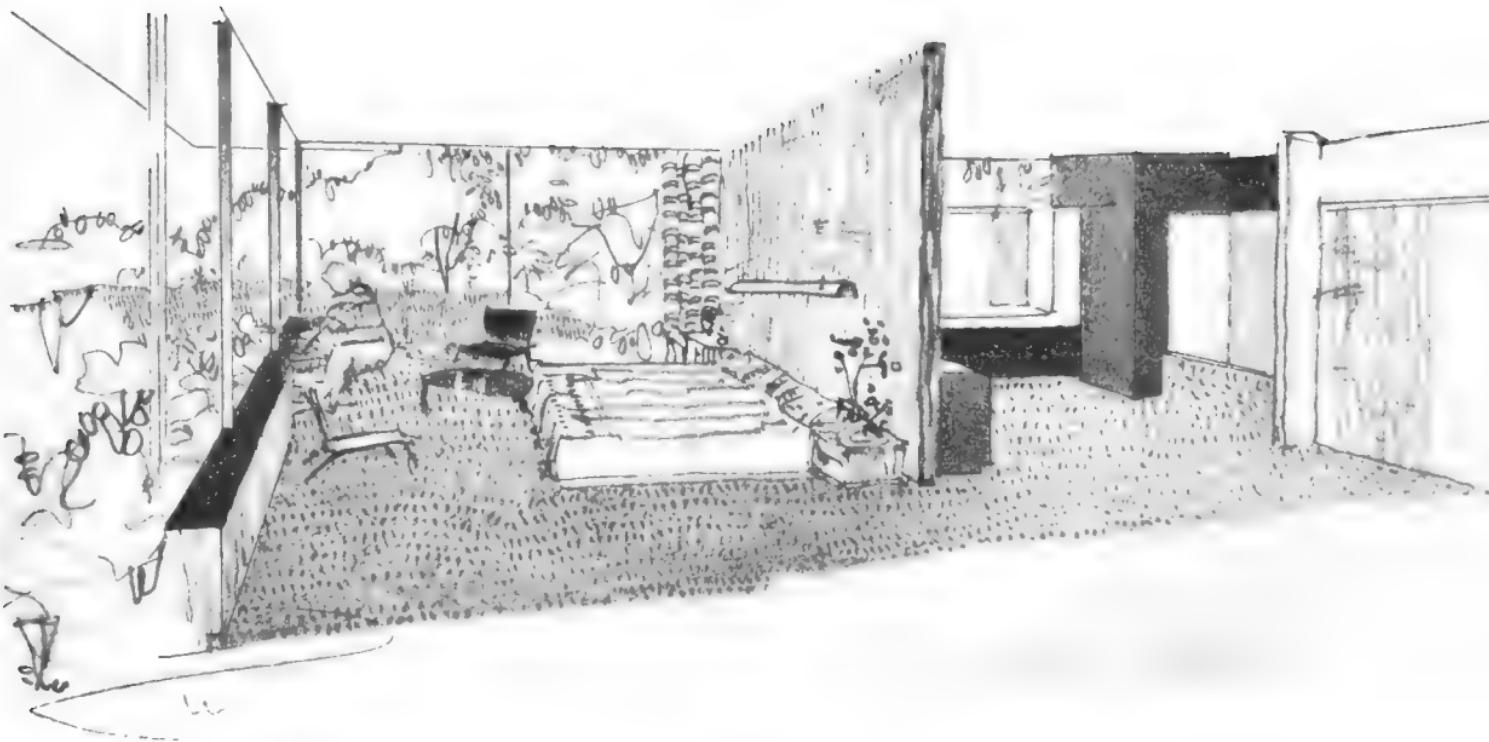
UPPER LEVEL



Floor plans of first and second floors. Planned for a steeply sloping one-half acre lot on the same tract as the two Eames and Saarinen houses, the house has bedrooms on lower floor, social rooms above. The main entrance is on the lower level. Perspective drawing (opposite) shows bedroom, bath and dressing room of master' suite on first floor.

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Designer: Rodney A. Walker

9945 Beverly Grove Drive, Beverly Hills

Size of lot: $\frac{1}{2}$ acre

Area of house: approx. 2000 square feet

One story with roof deck; 7 rooms: living-dining room, loggia, study, kitchen, 3 bedrooms, 2 baths

Material: striated plywood panels and brick, wood frame
Landscape Architects: Eckbo, Dean and Williams

Two views of loggia—combination entry, garden room and hall, 9 feet wide, 21 feet long and 11 feet high. All rooms can be entered through the loggia. The cantilevered stairway leads to roof deck. The loggia and patio are paved with earth-colored concrete blocks. The green heat-resistant glass between the beams gives the room a cool brilliance.



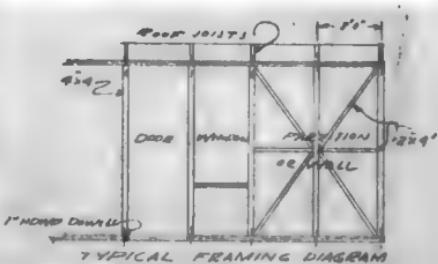
Three houses by Rodney A. Walker, two in 1947 (one shown here) and one in 1948, boldly faced the problem of the wood frame. In a 3-foot modular system, 4- by 4-inch posts are joined with dowels every 3 feet to ceiling and floor plates. Joists and posts are thus automatically aligned. Each 3-foot section contains a fire block and two diagonal braces, two adjacent spaces forming a complete X-truss. (See detail.)

"In addition to the strength achieved," Walker said, "the walls were broken up into triangles which took advantage of both horizontal and vertical ply of the striated plywood skin for all exterior and interior walls. The vertical module of 16 feet accommodated all door and window openings, and the 8-foot plywood panels could be used without waste."

"Framing for doors and windows was unnece-

sary because the 2-foot 8-inch space between posts could receive a standard door or window sash. For stationary glass panels the pane was slipped into grooves in the 4- by 4-inch posts and puttied. As no stops were required the posts were left clean."

There was sincerity in all of Walker's structures, from his low-cost plywood houses of the thirties to the present. He has tried out many systems in wood; when he has one thoroughly organized and has cut construction costs to a minimum, he is driven on to explore another. His decision to remain a designer rather than to become a licensed architect was based on his wish to contract and build his own designs. He spent a few months in R. M. Schindler's office, and some of Schindler's impatience to set up new problems for himself appears to have rubbed off on Walker.



Detail. Wood framing is based on a three-foot module. Half-inch holes are drilled in top and bottom of each 4- by 4-inch post every 3 feet and through ceiling joists where they are to be joined to the hardwood dowels $\frac{1}{2}$ -inch in diameter inserted in the holes automatically align all structural members.

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Designer: Rodney A. Walker

199 Chautauqua Way, Pacific Palisades

Size of lot: $\frac{1}{3}$ acre

Area of house: 1800 square feet

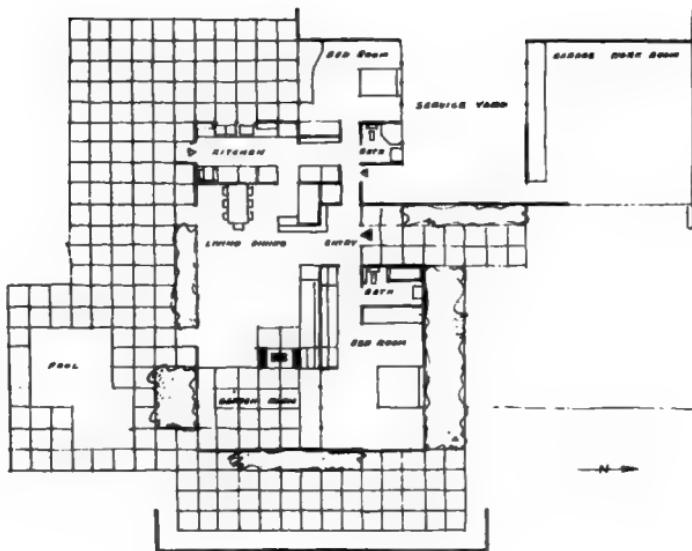
One story; 5 rooms: living-dining, garden room, kitchen, two
bedrooms, 2 baths

Material: striated plywood panels over wood frame

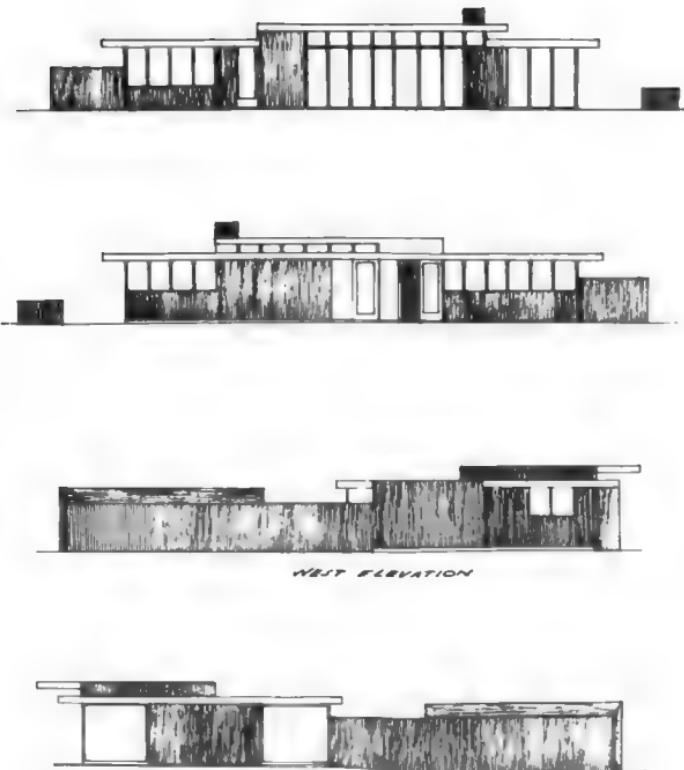
Elevations. The west side, facing the road, has been kept solid for privacy, and opened with glass on the south and east toward the unobstructed view of the ocean. Bedrooms, baths and entrance are on the north.

Perspective drawing. The living room and garden room are divided by a two-way open fireplace. The ceiling is 11 feet high, has open beams and clerestory windows on north and east.





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Architects: Kemper Nomland and Kemper Nomland, Jr.

711 San Rafael Avenue, Pasadena

Size of lot: $\frac{1}{2}$ acre

Area of house: 1900 square feet

One story; 5 rooms: living-dining, kitchen, study, 2 bedrooms

Material: striated plywood panels over wood frame

A 1947 house, by Kemper Nomland, on which Kemper Nomland, Jr. was designer, was planned for a grove of eucalyptus in Pasadena. As the lot drops away on two sides, the house is built on several levels. A simple shed roof covering the entire house parallels the slope of the ground.

Exterior and interior walls are of plywood, which was obtainable in abundance by 1947. Corrugated wire glass, a product used widely in commercial buildings and in other Case Studies, forms a wall between the living room and the hall, and lights the hall.



View of living and dining terraces facing the woods at rear of house. All-plywood house for a sloping lot in on several levels; a simple shed roof parallels the slope.

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Architect: Thornton Abell

634 North Deerfield Avenue, San Gabriel

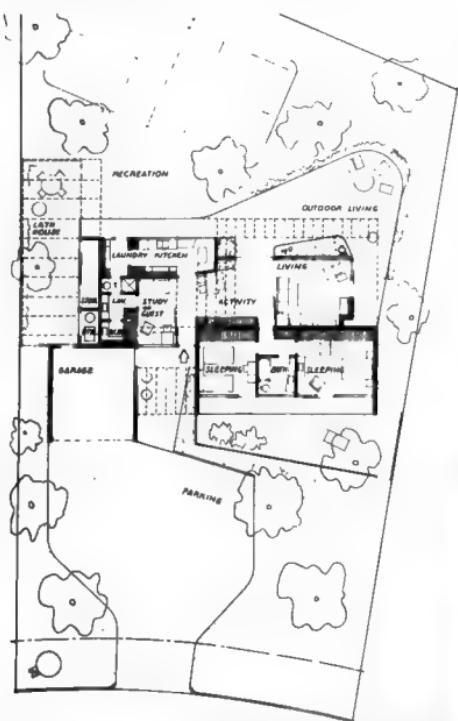
Size of lot: 95 by 138 feet

Area of house: 1800 square feet

One story; 5 rooms: living-dining, study, kitchen, 2 bedrooms,

2 baths

Material: concrete block



Living room, activity room and kitchen of the concrete block house have large openings to a secluded terrace on the south-east. A skylight over an inside planting area brings in the afternoon sun. The street front (right), considered good in 1948, features a redwood fence which screens a bedroom patio.

Thornton Abell's 1800-square foot house of concrete block, built in 1948, is an early effort in the field of minimal housing to develop a living environment behind solid walls on the street front. Behind a high garden fence of spaced redwood is a patio sheltered from the street; glass walls of two bedrooms face the patio.

A trellis above the indented entry court, and the fascia along the eave of the bedroom wing, give continuity and variety to the broad horizontal surfaces established, while the parallel lines on different planes bring depth to the facade. Abell borrowed the advancing and receding parallel planes, composed of different textures, for his own office, which won an A.I.A. award in 1954.

The concrete block, selected because of low maintenance, has worked out well from the owner's point of view. Although the plastic coating on the block has cut out moisture problems, Abell regrets that the texture of the block was sacrificed.

Speaking of materials and time, Abell said: "Products are usually put on the market before they are proved out, and it is up to the architect to test what industry develops—and the client becomes a collaborator in the experiments. The problem of the architect is to walk a tight rope between experimentation and prudence."

An example is Abell's use of skylights in rooms which face a single light source; these balance the outside light. He stated: "Skylights have improved tremendously since I installed a galvanized iron one in my own house twenty-three years ago. It leaked in different places in each light rain but was weathertight in a downpour. The aluminum and wire glass one that I used in the Case Study was an improvement, but it expanded and contracted with changes in weather, and emitted strange and disturbing noises. We've had a long wait for one that's both watertight and silent—made of a single sheet of acrylic."



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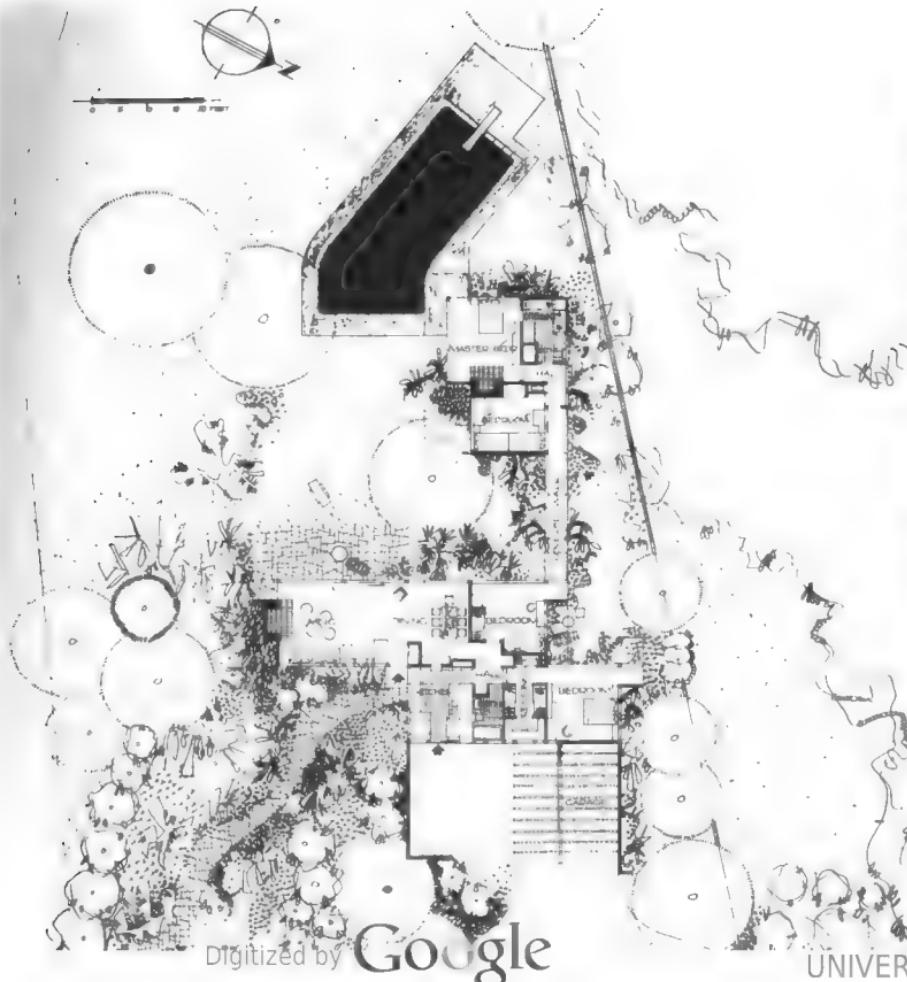
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One of four Case Study houses built on a wooded tract overlooking the ocean. To the left along a curving private road are the Eames' and Entenza homes; a Rodney Walker is across the street. All co-exist comfortably in the well laid-out tract



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Perspective drawing. Living-dining room, with glass-walled garden room at right. The free relationship of living and garden rooms offers some separation between social activities of parents and children.



The garden room, with its louvered skylight, is also entrance hall.
Doors were to remain open most of the year to make the rooms a part of the enclosed garden beyond.

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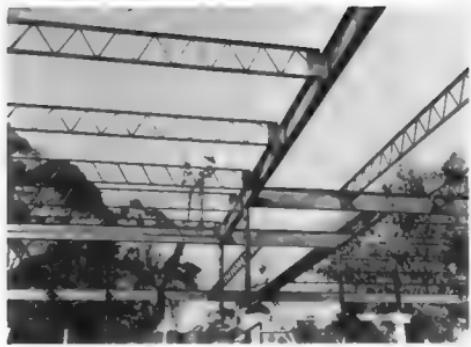


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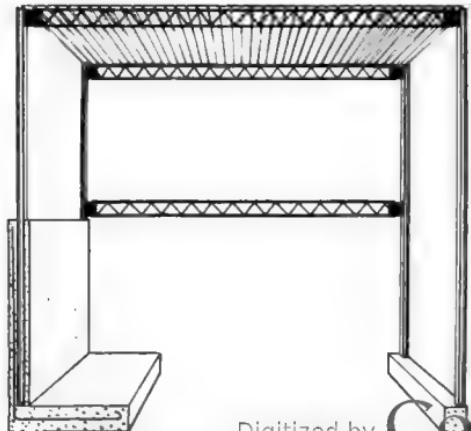


View from the living room looking toward terrace. At left, under balcony, is an intimate conversation corner. The 7½-foot module was convenient because the steel decking spanned the columns; the module was also compatible with the first and second floor ceiling heights.

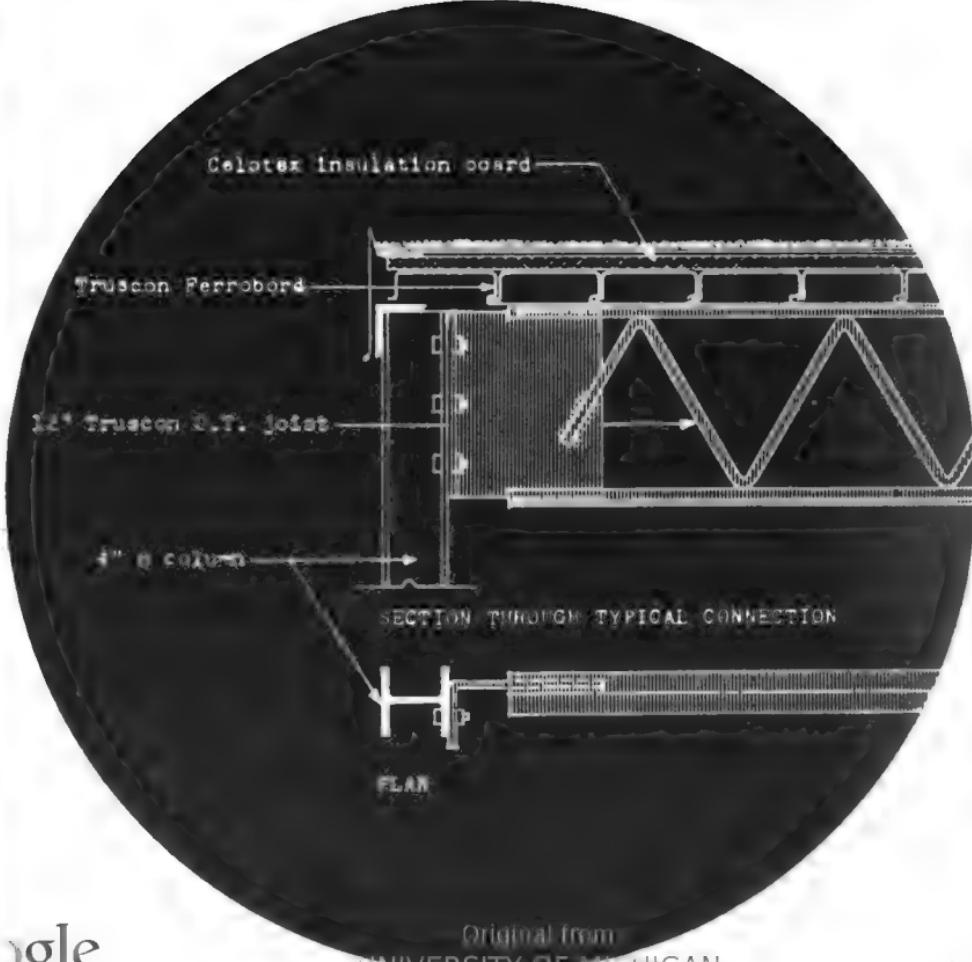
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Sectional view. Cross section of structure and retaining wall showing joist condition at both the two-story and 18-foot bay. Extending 8 inches above the finish floor level are 4-inch H-columns 20 feet apart to form $7\frac{1}{2}$ -foot bays. Columns at left are embedded in the 8-foot high retaining wall. Open-web joists span the columns.



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View from the bedroom balcony toward the living terrace and ocean.

Spaces between the columns are filled in with two standard projected sash 8 feet high, fixed glass, or plaster panel painted different colors.

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**Designer: Charles Eames
Architect: Eero Saarinen**

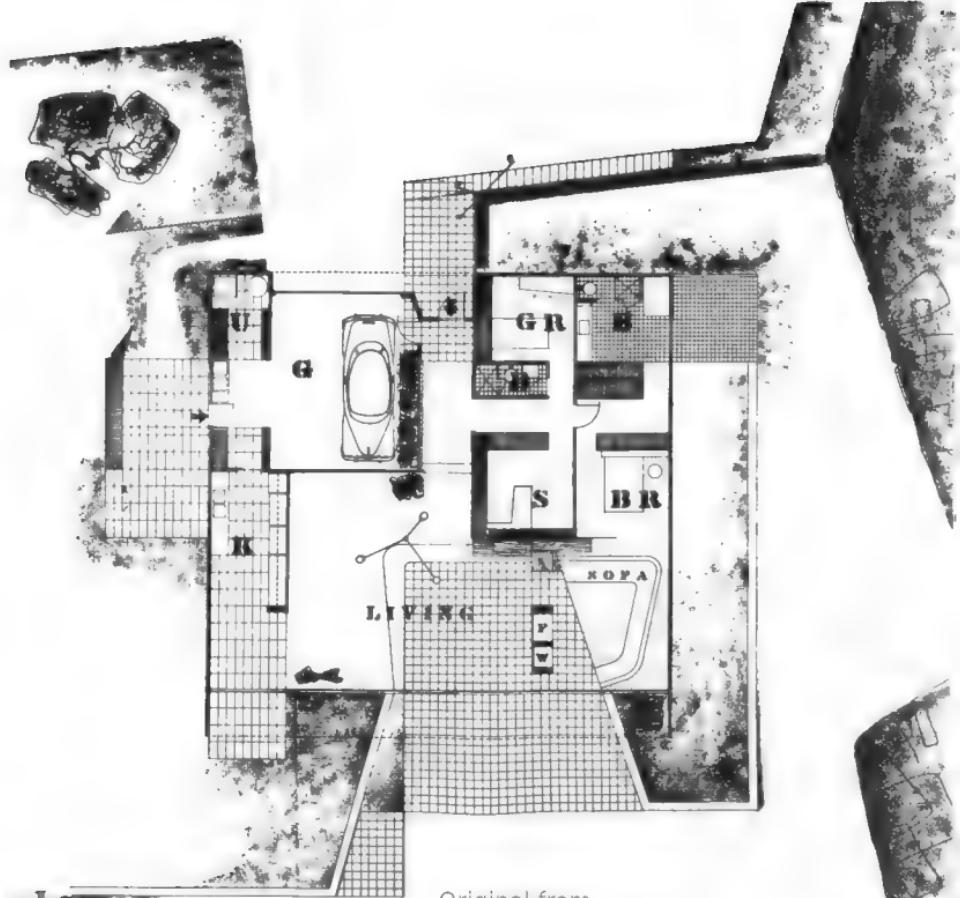
201 Chautauqua Way, Pacific Palisades

Size of lot: 1½ acres

Area of house: 1800 square feet

One story; 5 rooms: living-dining, study, kitchen, 2 bedrooms,
2 baths

Material: steel decking over steel frame



South side of house is open to meadow and sea view. Raised terrace at left is for dining, with outdoor living at right. Concrete block wall (far right) encloses a patio for master bedroom and bath.

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**Designer: Charles Eames
Architect: Eero Saarinen**

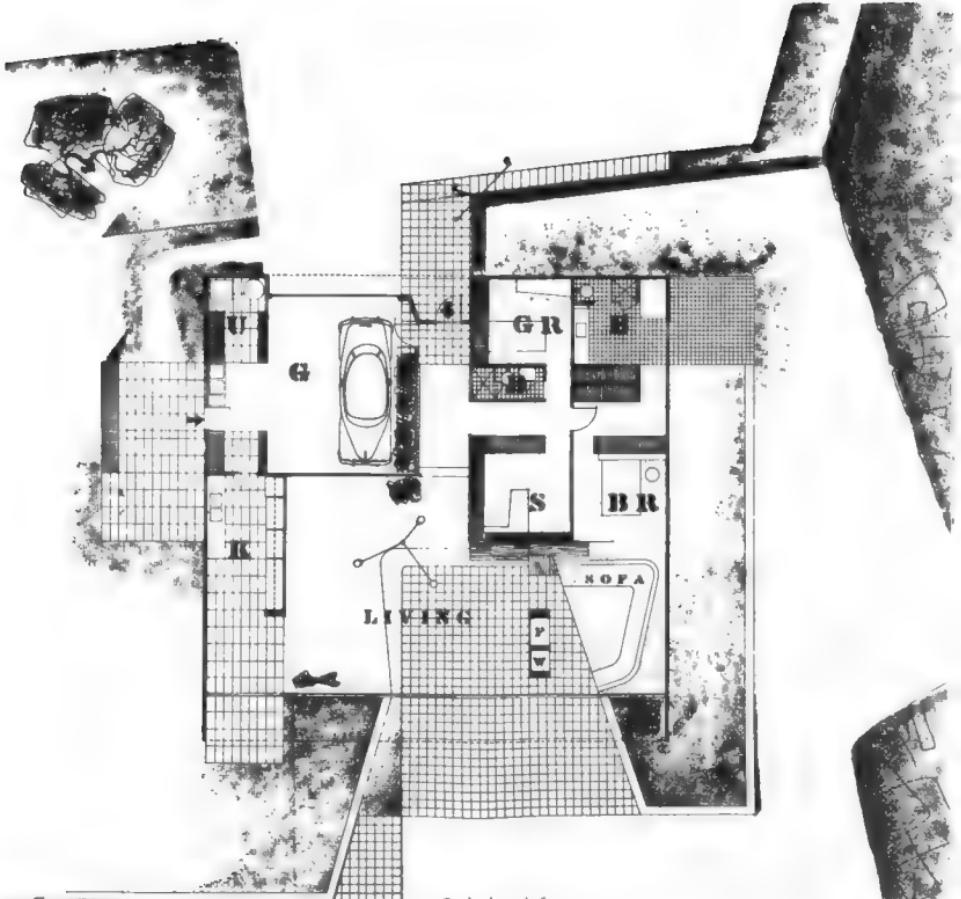
201 Chautauqua Way, Pacific Palisades

Size of lot: $1\frac{1}{2}$ acres

Area of house: 1800 square feet

One story; 5 rooms: living-dining, study, kitchen, 2 bedrooms,
2 baths

Material: steel decking over steel frame

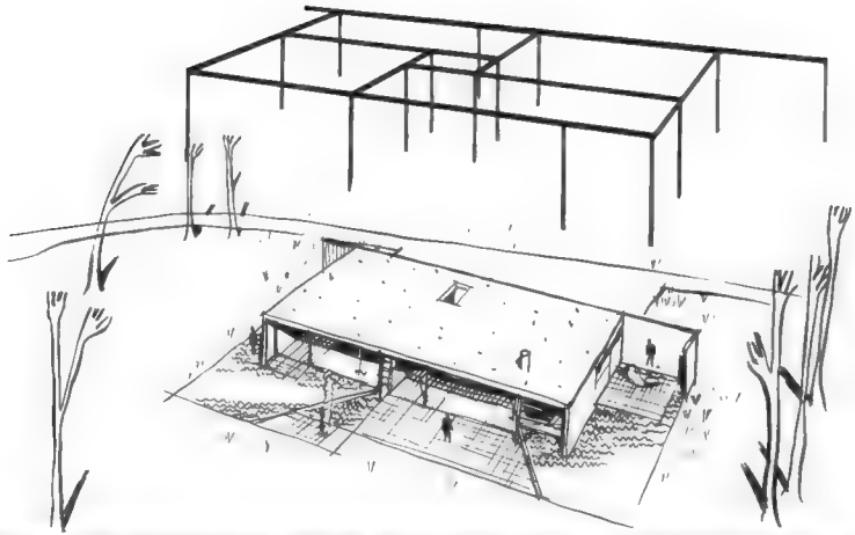


South side of house is open to meadow and sea view. Raised terrace at left is for dining, with outdoor dining at right... Concrete block wall (far right) encloses a patio for master bedroom and bath.

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The 36-foot long living room is planned around the principle of elastic space; well defined areas for intimate conversations or group discussion flow together for large parties.

Steel frame in place. The joists employed have square ends and angle connections which frame directly into 4-inch H-columns, 7½ feet on center. This module was convenient as it could be spanned by the steel decking with no intermediate support, and the space between the columns could be filled by two standard projected ash 8 feet high.





←

Entrance is separated from garage by panels of corrugated glass. Behind the screen is a planting area with skylight above to light the entrance. Planting is backlit at night for dramatic effect. The ceiling is of tongue and groove habillo boarding.

Upper level of living room and step are carpeted; lower level, on same plane as terrace, is paved with concrete. Steps, used for informal sitting to large gatherings, encourage guests to break up into small groups. Behind the wall at left is the kitchen.





Architect: Raphael Soriano

1080 Ravoli Drive, Pacific Palisades

Size of lot: $\frac{1}{4}$ acre

Area of house: 1600 square feet

One story; 5 rooms: living room, dining, kitchen, 2 bedrooms,
2 baths

Material: plaster and panels of masonite and corrugated glass;
steel frame



View from the dining terrace toward the Santa Monica Mountains to the north. The plans for the house were three months in the city building department before being approved while construction of frame and laying of roof decking required 24 hours.

The leap from the early Case Studies to Raphael Soriano's steel pavilion was a leap from the particular to the general, from the personal to the impersonal, from the isolated case to the prototype. "If you are looking for a solution for housing from the twentieth century, which I am, the general and the individual must be identical," says Soriano.

His goal has always been the pavilion. His style, for which he is indebted to Mies van der Rohe, had its starting point in the strict module. "Modular planning is particularly important in steel, where logic and economy are usually identical. Tricks are costly and hazardous." His pro-

cedure is to find among the standard sections the cheapest and most readily available elements. He has run the gamut of steel: from junior I-beams in a plaster house in 1936 and expanded steel studs the following year, to shop-welded light steel frames in 1955. His style began to crystallize in 1942 in the Hollowell Seed Company buildings in San Francisco. Most of his standard practices appeared there—glass walls set back behind 3½-inch pipe columns, and roofs cantilevered 4 feet beyond the columns. The recessed glass adds to the pavilion-like character of his buildings. His ceilings are the standard 8 feet in height, and doors are invariably ceiling height.

William Porush, structural engineer and teacher at California Institute of Technology, also Soriano's engineer for many years, describes him as exacting:

"It seems all right to me to take a beam and a column and a couple of plates and bolt them together. But not to Soriano. He avoids a detail that shows up too much, or anything that's clumsy. My eyes are different from architects'. Architects are here to make an engineer's life miserable. But the others aren't as hard on me as Soriano—he always beats me down. He rejects one detail after another, then we sit down for an hour and knock our heads together until we work out some-



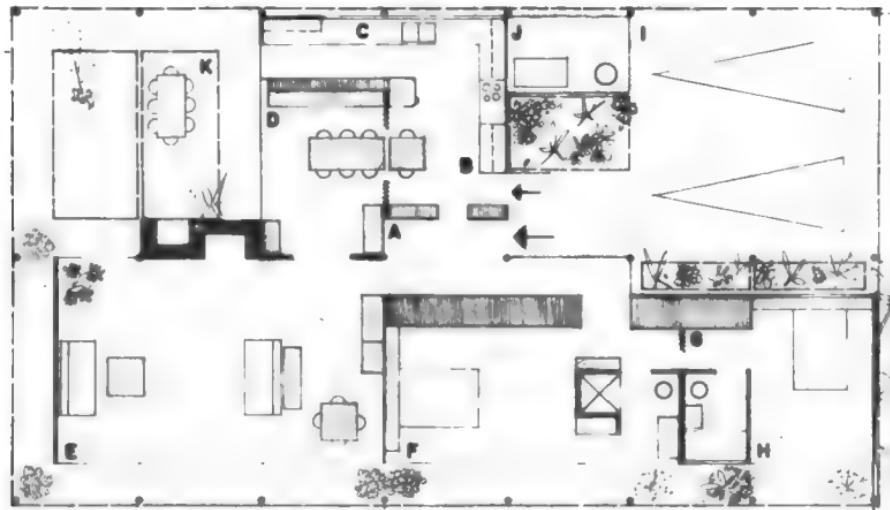
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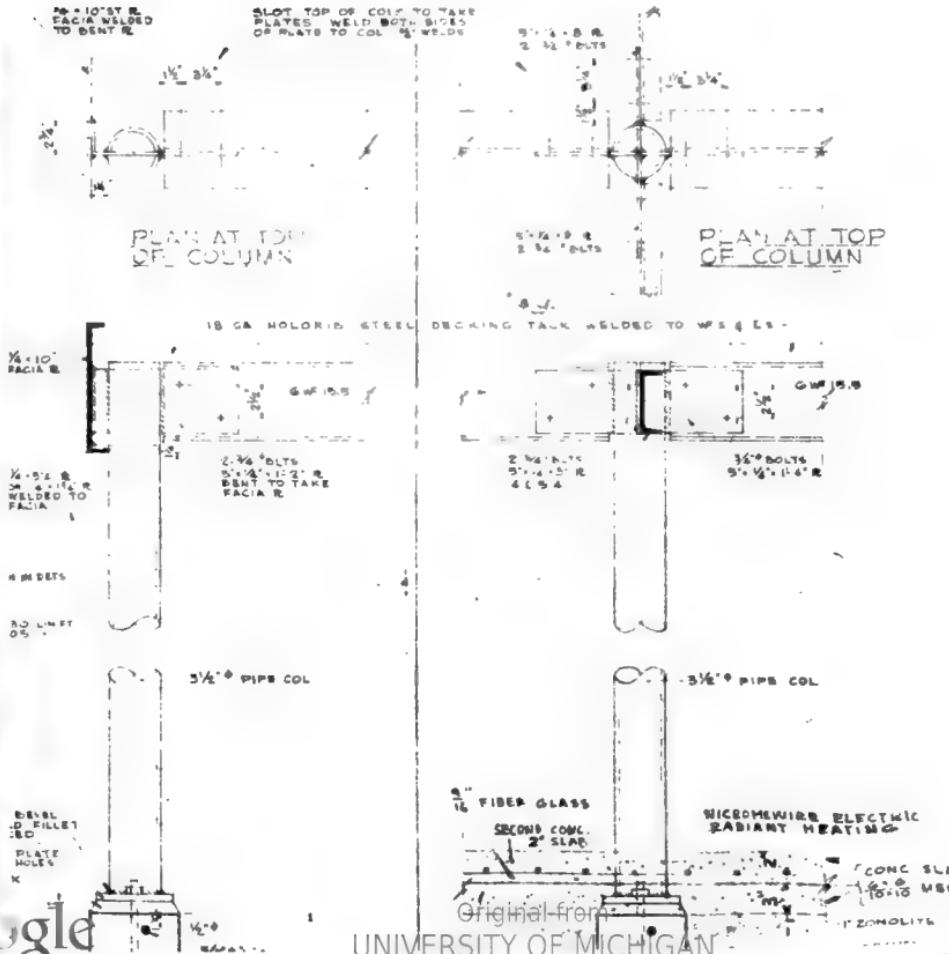


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The wide flange beams cut through the fascia channel to span an opening in the partially-roofed dining court.





Dining court off the dining room and kitchen is oriented to the north and east. Sliding glass, which connects it with the garden off the living room, makes the court wind-free. The 20- by 20-foot court has a roof opening 14 by 14 feet, with three small planting areas opened up in the slab below. The living room fireplace wall has an opening in the court for a barbecue.



View of living room toward dining and kitchen. Entrance to the living room is through the hall when accordion doors are closed. Dark panel at left is front door. Soriano's doors are always ceiling height, which is invariably 8 feet.

Living room. All of the structural members are painted a rust-red in a shade dark enough so members are minimized. Other colors are kept to neutral tones so the pavilion structure rather than individual pieces of furniture is emphasized. The living room paneling is Kashi wood.



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utilities. Two and one-half inches of the bottom flange of each beam were left visible by the device of using metal plaster trim to align with the exposed steel columns.

The basic house is an 8-foot modular rectangle enclosing 1750 square feet, and the frame is filled in with rough Palos Verdes stone, fixed and sliding glass, and fir siding. Translucent screens, 10 feet in height, which are treated as extended house walls, enclose garden spaces, thus expanding the plan of the house. The two bedrooms, children's play yard, and service yard are lengthened or defined by these elegant screens.

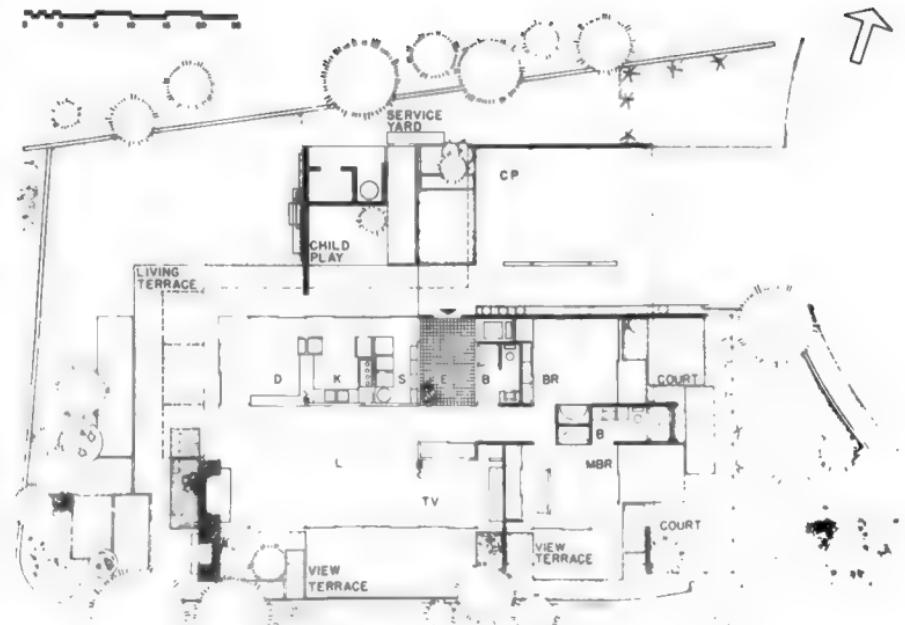
Ellwood also emphasizes his interior walls, which he treats as screens. They are composed of the same material as exterior walls. The panels are expressed by exposing the steel columns and painting them black; by lifting the panels from the floor; and by the use of a glazed strip between wall and ceiling.

From a practical, as well as an esthetic, standpoint, the recessed base, painted black, is excellent. No mop can scratch the wood panel.

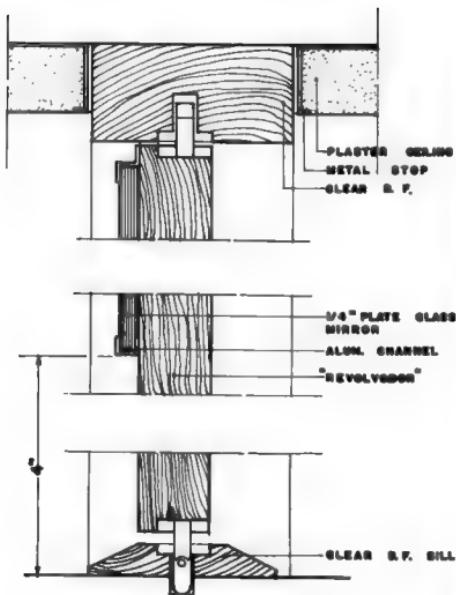
Small in square footage, the house is broadened and extended in many unexpected ways. An example is the mirror wall in a small bedroom, and sliding glass wall opening it to a screened court. The mirror pivots to permit access to a small dressing room, conveniently equipped with a wash basin set in a counter. (See detail.)

Ellwood considers rhythm at the base of all design. "Form is decoration: the rhythmic interplay of mass and volume and line. Material is decoration: the rhythmic emphasis of texture and color. Depth is decoration: the rhythmic movement and delight of light and color."¹⁷

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Bedroom with pivoting mirror at left; behind the mirror is a small dressing room with wash basin. Detail drawing (above).

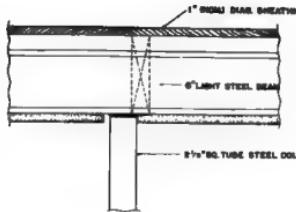
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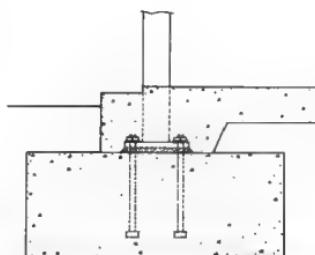
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The frame of 2½-inch square steel columns and 8-inch I-beams is worked out on an 8-foot module for the 28- by 58-foot house. All connections are job-welded. The site is a flat pad on a hillside with city and sea views to the south and a view of the mountains to the west.



Detail of structural scheme (right). Columns were shop-welded to leveling plates; beams were shop-punched on 2-foot centers to receive bolted 2- by 8-inch wood blocking on either side of the web. All field connections except bolted leveling plates were welded.



For the street side fence translucent panels of glass are set in frames of 2½-inch square tubing; privacy is gained for courtyards without limiting the light. At right is carport, divided from entry walk by freestanding hollow clay block wall.





All rooms are accessible from the hall. Non-structural wall panels are emphasized by recessing the base and keeping them below ceiling height. The system of glazing between wall and ceiling creates a continuous ceiling plane and allows the roof to float free of the walls.



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block wall was designed by landscape
architects. Two sets of intersecting pipes are welded
to units prefabricated and placed in the
wall. Each set is attached at four points to



Northwest corner, across living terrace toward view
in the city.
Sun screen is made of inverted steel angles welded to 2½ in.
square tubing.

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Jungle gym on the hollow block wall was designed by landscape architect Eric Armstrong. Five sets of intersecting pipes are welded at points of intersection, the units prefabricated and placed in the wall during construction. Each set is attached at four points to insure strength.



Northwest corner, across living terrace toward view of the city.
Sun screen is made of inverted pipe sections, welded to 1 1/2-in.
square tubing.

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Counters separate living from dining, and dining from kitchen
accordion screen closes off kitchen. Glass-doored dish storage is
backed up against oven. The children's snack counter is close to
the play yard.



On the west side, 8- by 8-foot sliding and fixed glass faces the mountains. Rectangular mass of the chimney and random pattern of the rough-textured earthy Palos Verdes stone contrast with the fine lines of the steel.

Original interior design
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The living room was purposely kept to a minimum because the owners enjoy conversations with a few friends rather than large groups. The children's recreation room (photograph, far right) is out of sight and sound of the parents' social area.

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Circulation lanes along the glass wall and the exterior brick wall on north make islands of the kitchen and dining room, keeping work and social areas free of traffic. The kitchen work counter serves as coffee bar or buffet for children's lunches eaten on terrace.



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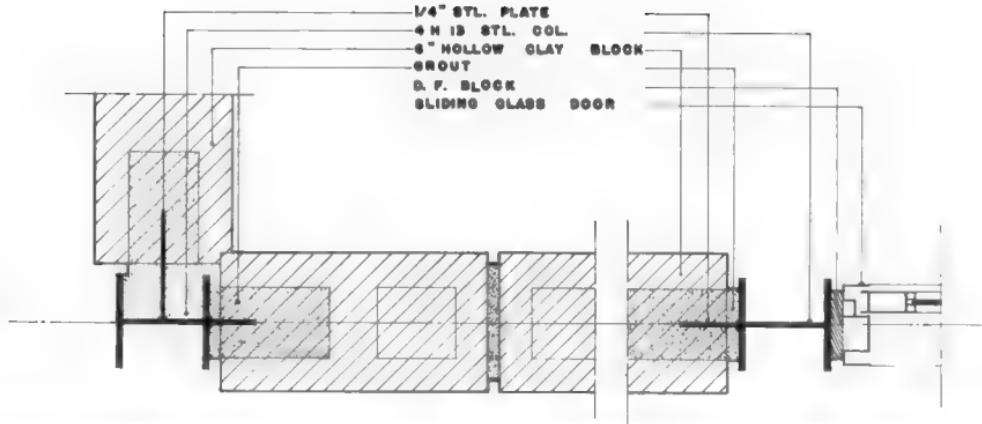
South elevation. Translucent screen of 4- by 13-foot panels of obscure glass encloses children's court. Behind masonry wall at right is master suite, oriented to an enclosed court on the east.



Each child's room has two bunk beds cantilevered out from the wall—the second bunk for a guest. The gray and tan terrazzo floor extends four feet into the court—the width of the veranda—to add play space to the small room.

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Reinforcing rods are placed in cells of the 8- or 8-inch hollow brick, and cavities filled with concrete.



Such traditional materials as brick and wood are combined with steel; the skeleton is 4-inch H-13# columns and 5-inch I-10# beams, with 5-inch steel channels 6.7# for fascias. Spanning the 1-beam joists are 16-inch ceiling joists 16 inches on centers; 1- by 6-inch fir laid diagonally is roof sheathing to which 1- by 4-inch board and glass cladding is applied.



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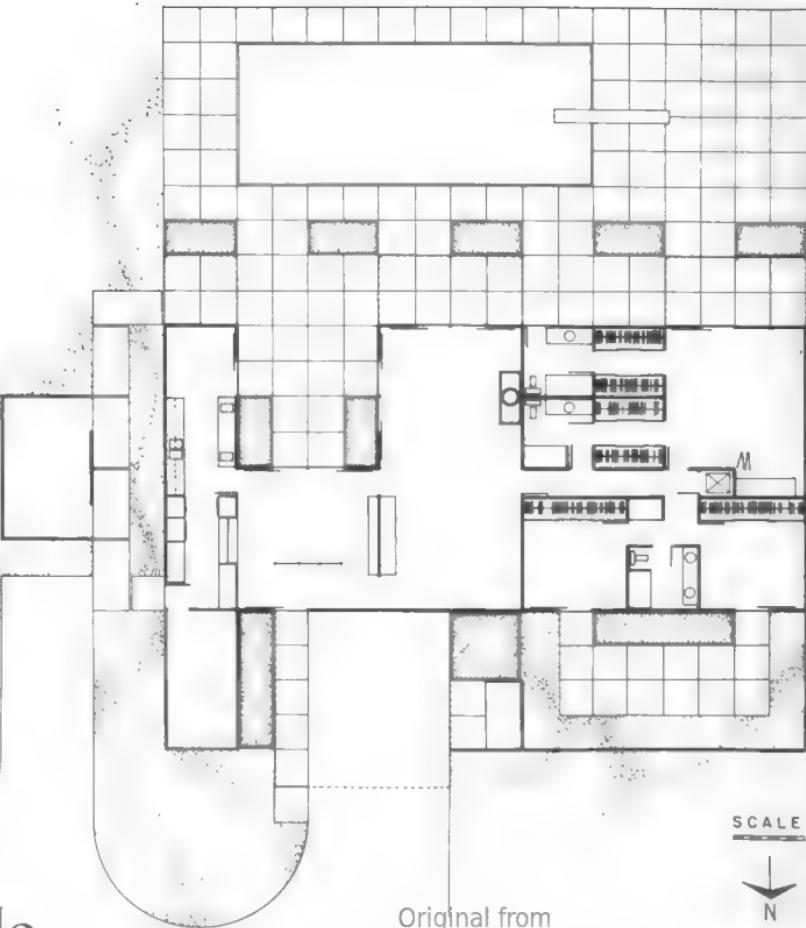


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built, no attempt at disguise has been made here. The architecture is based upon the system utilized, and the visual organization properly reflects the system."¹⁹

The elements of the system are strongly defined with color: ceilings and panels are off-white and the steel framework is blue. Since room partitions occur on module or mid-module, there is unity between structure and plan and structure and form. The color-defined frame thus provides a visual rhythm which emphasizes this unity.

The product house, Ellwood demonstrated in his three Case Studies, is compatible with elegance. Although he bestows elegance upon common materials, those in some recent houses are more luxurious. Carrara white marble panels are specified for a house in Northern California. He has now broken away from the 4- and 8-foot module, in one instance, at least, using a 14-foot modular steel frame. There is a change in framing material for a house on the beach now being planned—a reinforced concrete frame has thin concrete panels for infilling.



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South elevation. A patio cuts into the plan on the south, with breakfast room (far right) and living room opening onto the roofed

The 18- by 36-foot pool was floated on compacted fill.

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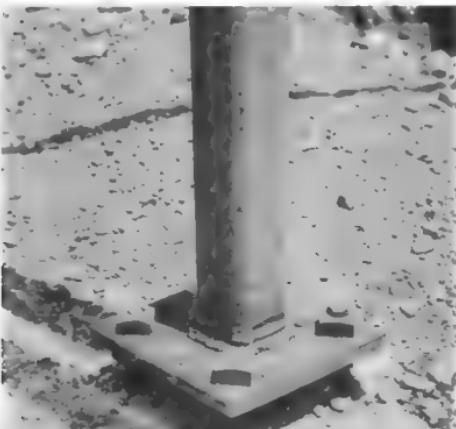
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Shop fabricated 16-foot bents are hoisted into place by crane. Job welding was limited to 19 beam connections and 40 column base plate connections. An advantage of the steel frame is that it can be erected in a day, roofed immediately; the slab is poured and work continues under cover—a consideration with California's seasonal rains.

Prefabricated sandwich panels with resin-impregnated plywood face are inserted into the 8-foot modular steel frame. The panels are held in place with a 2½- by 3/16-inch steel batt screwed to the steel column and to the steel beam under the eave line.



←
Tubular columns are fastened to simple grade footings, leveled with shims and leveling bolts.



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Front entrance is through sliding glass door. The prefabricated sandwich wall panels are painted an off-white; the steel blue.

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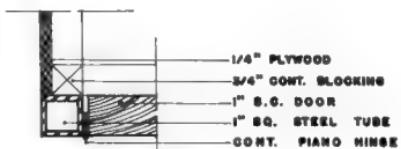
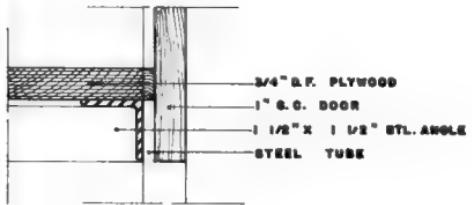
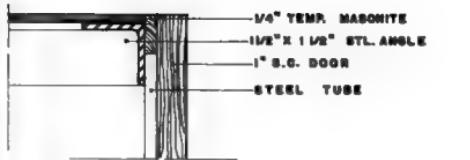


→
Gallery and entrance hall. Sandwich panels are faced with mahogany plywood. Skylight in hall of bedroom wing (photo far right).

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Detail drawing. Section through bar.



Dining room with bar. Glass screen separates dining from entrance hall.



Desk corner of the master bedroom is lighted by a floor to ceiling
louvre lamp.

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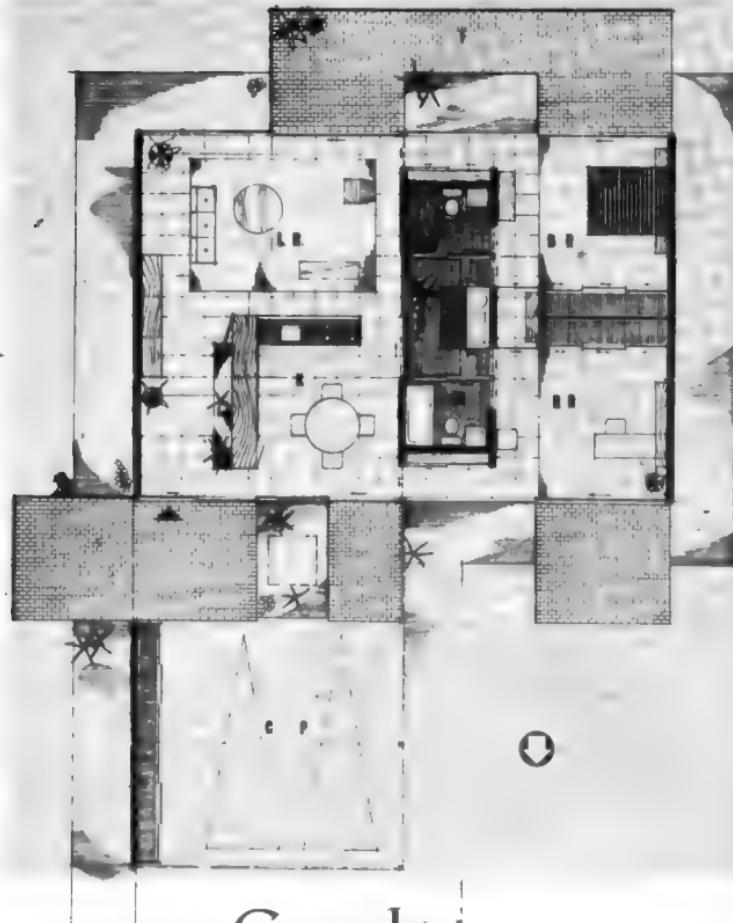
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Koenig handles his basic industrial materials with unusual sparseness to achieve noble perspectives. His dispassionate examination of steel is accompanied by an inventiveness of plan and detail, a sensitivity of proportions, and in Case Study House Number 22 a sensuous feeling for water.

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Main entrance is through sliding glass doors (left); entrance court is accessible from street or carport. Below the roof opening is a planting area.



"The design is beautifully articulated in steel and represents some of the cleanest and most immaculate thinking in the development of the small contemporary house." —John Entenza

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The house is an island set in reflecting pools. Joined by piping to maintain circulation; water is pumped during summer onto the roof for cooling and aeration. Water falls from projecting scuppers back into the pools. Living room is shown opposite.





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All steel kitchen has wall-hung refrigerator with stainless steel counter space. Colors are white and charcoal gray.



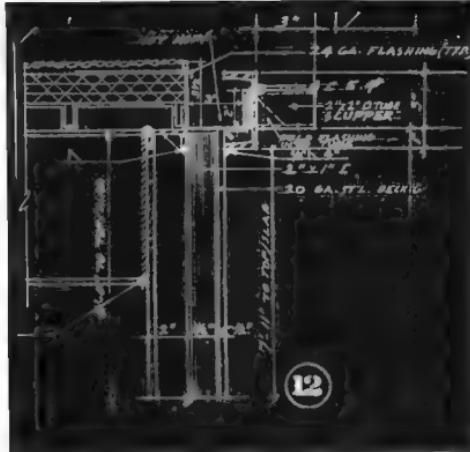
Open court between the two bathrooms. By detaching bathrooms from the exterior the design of the curtain walls was simplified; both baths are entered from a bedroom or through sliding opaque glass to the court. In this view the sliding glass is open.



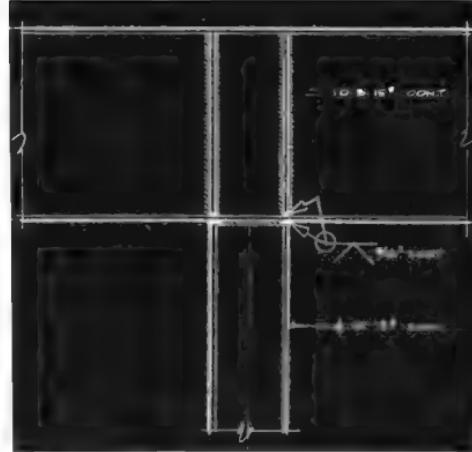
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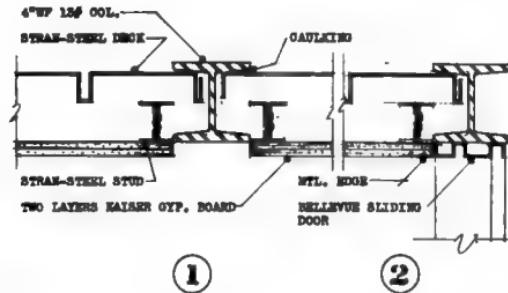




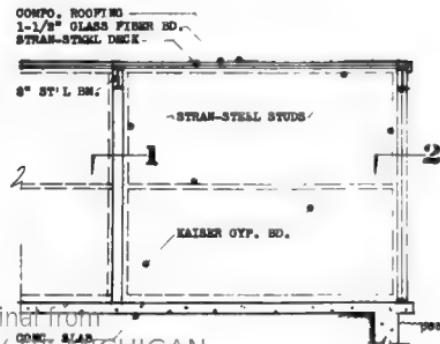
Gutter detail.



Beam to column connection.



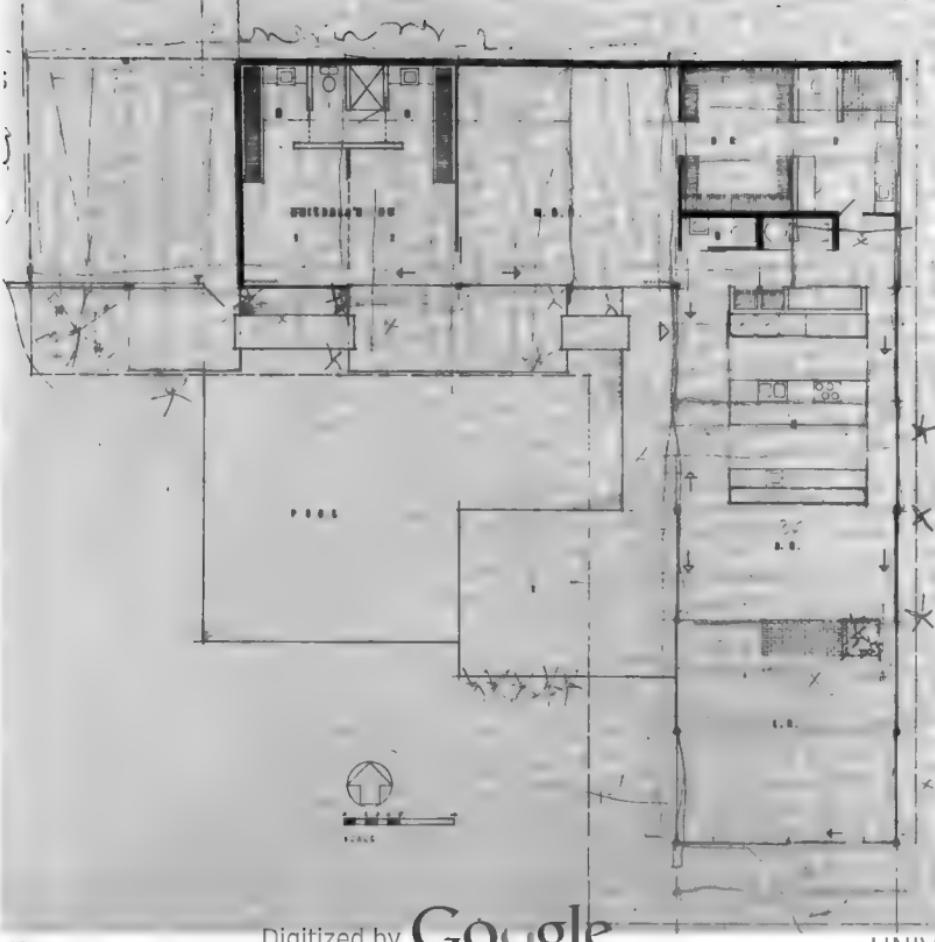
Each steel frame is a square 4 feet long and 9 feet high; it includes beam, floor channel and three columns; the frames are shop-fabricated and delivered to the site in one piece. Riveted connections left exposed are welded and ground smooth.



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Terraces were built before Koenig planned the house. The built-up terrace in foreground, facing east, is for breakfast.

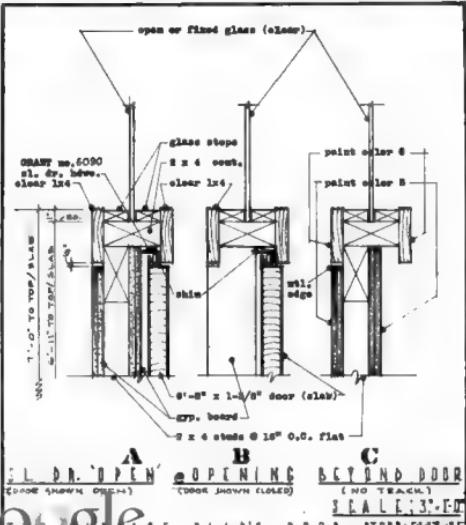
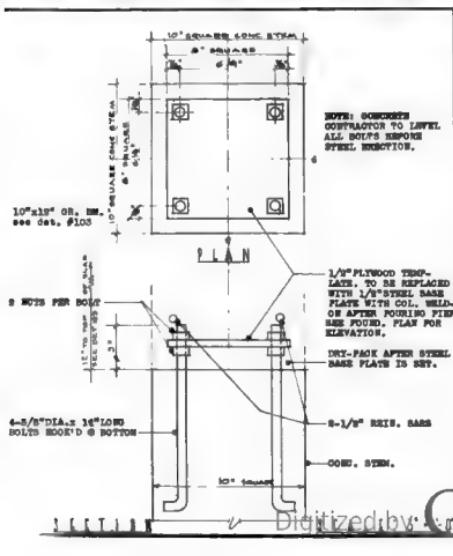
Steel decking wall is employed to obtain privacy at the street entrance; all other exterior walls are glass. The steel is painted dark gray-tan and the decking is a light tone of the same color.





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The L-shaped house, three bays wide and four bays long, was erected in one day with five men and a 180-degree stringer crane. Enclosed space is 2300 square feet; overhang and carport account for the 4000 square feet of roofed area.

Twelve-inch 16.5-pound beams and 4-inch WF 13-pound columns are spaced 20 feet on centers to create 20- by 20-foot bays.

The two- and L-shaped house fill almost all of the buildable area. With pool set close to the edge of the cliff, water and sky blend together.



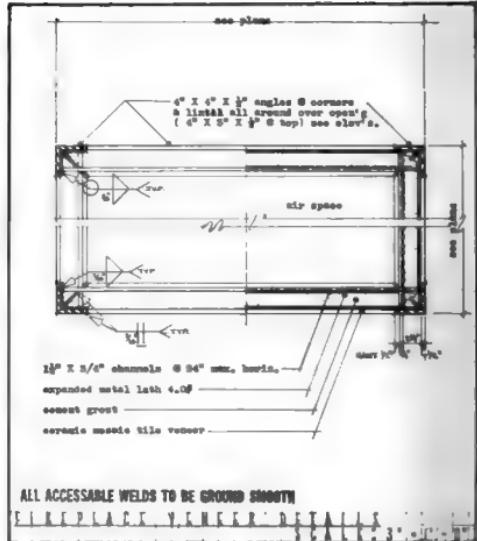
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Fireplace is a frame of 4- by 4-inch angles of 18-gage steel; the 20-inch diameter steel sheet chimney was shop fabricated and installed as a unit during erection of the framework.



Two kitchen counters are freestanding; mechanical equipment is hooked up against the wall of the master bedroom. The cabinets and top panels are prefabricated, with welded aluminum top and bottom frames and pre-cut wood panels.

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View from children's bedroom toward pool and living room. Hall is along the glass wall; the room is closed off by accordion wall. Master bedroom (left).

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Entry; kitchen at left, living room beyond. Traffic lane is along the glazed wall.

Night silhouette from living room and terrace. Eight-foot overhangs protect the series of ten-foot panels of glass from the west sun, while giving the entire social area to the 240-degree view.



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Entrance walk and studio from carport; double doors to the dining court and house extend out from bas-relief screen of white tile.

Dining court with sliding doors at left to dining room. Two-foot wide plastic panels separate entry walk from the studio-master bedroom court. The double front door is two framed 4-foot panels of sheet plastic; passage to house is through an unroofed court.

bays are roofed with the sandwich panels and factory-formed vaults. The vaults were custom-built for the job to the same 2-inch thickness as the panels, and were pressure-glued and bent into the required forms.

"We wondered for a while about the validity of detaching the roof and denying the system already established in the rectangle," Straub said: "But for this particular client we wanted to break down the uniformity and arrive at a new expression."

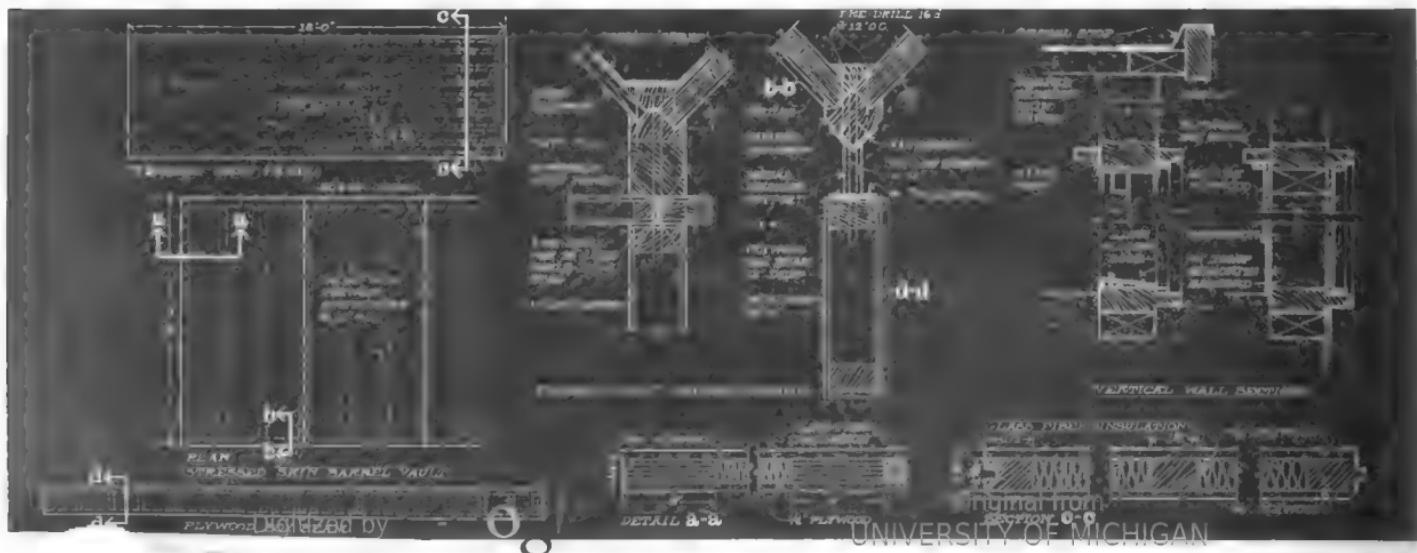
Although the architects were the first to use the vaults, they consider the space relationships more radical in nature than the factory products. Nevertheless, they had their difficulties in obtaining a permit from the city building department.

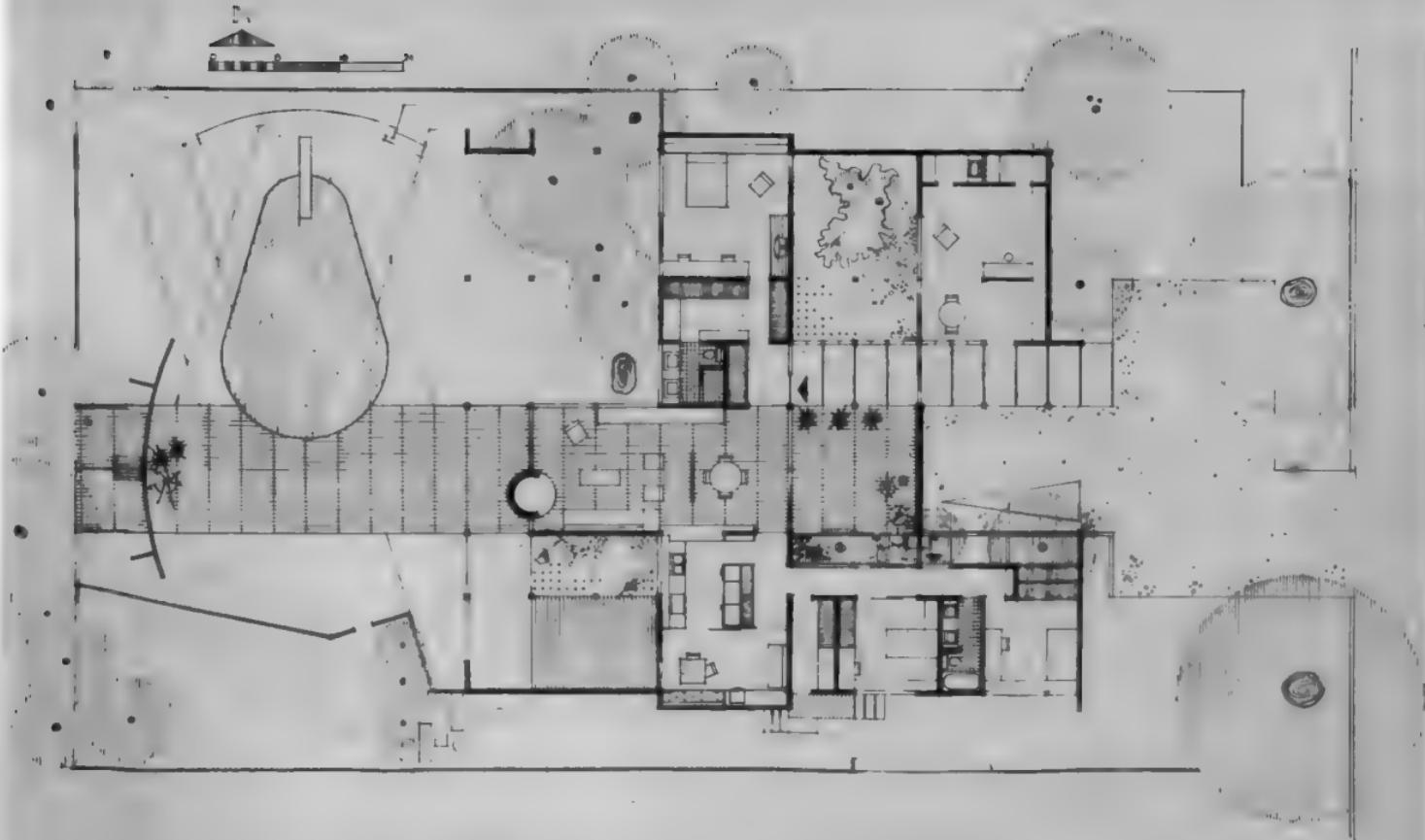
"We presented them all sorts of calculations—so did the plywood engineers—but the city wasn't satisfied until one vault was erected and jumped on," the architects recalled.

As in all experimental work, no saving in cost is accomplished when testing out new factory elements. An enormous amount of time was spent in an initial study of the sandwich panels and vaults and the box beams to make them compatible with architecture; the numerous conferences with men in the city building department were also time-consuming. Factory-trained workers may set up a frame in a matter of hours, but the crew which prepares the foundation and takes over after the frame is up are hand-craftsmen.

Technology, when applied piecemeal, raises the costs of building. The only way that the use of the plywood elements could have been proved an economy was for the architects, after solving the basic design problems, to carry their knowledge into tract housing. However, this was not done.

It is to the credit of the Case Study program that it presents the spade work accomplished in new fields. Industry fulfills its function in developing stock component parts; the architect contributes his research. By following experimental work through its design and construction phases to the finished and furnished house, "Arts & Architecture" provides the opportunity for the public to be informed and to contribute encouragement.





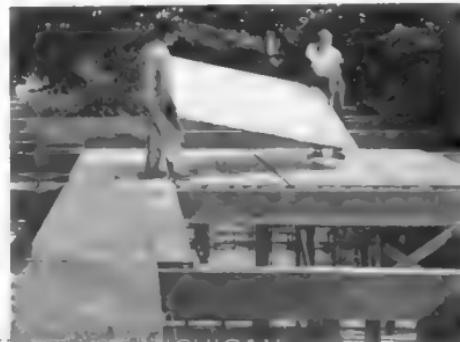
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Factory-formed vaults of sandwich construction serving as roof of living room (opposite page) were transported to the site; they were bolted into position and secured in one and a half hours.

A series of 8- by 8-foot bays are roofed with stressed-skin sandwich panels; edges are tongue and grooved, and slightly beveled to form a good looking joint. Fir plywood box beams spanning 16 feet support both the vaults and the flat panels.



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Entrance walk and studio from carport; double doors to the dining court and house extend out from bas-relief screen of white tile.



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wide plastic panels separate dining walk from the studio-master
bedroom court. The double front door is two framed 4-foot panels
of sheet plastic; passage to house is through an unroofed court



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Entrance walk and studio from carport; double doors to the dining court and house extend out from bas-relief screen of white tile.



Dining court with sliding doors at left to dining room. Two-foot wide plastic panels separate entry walk from the studio-master bedroom court. The double front door is two framed 4-foot panels of sheet plastic passage to house in through an unroofed court.



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From the kitchen, divided from living-dining room by a counter, is a view of trunk of the stone pine growing outside living room glass wall. Time-motion studies determined design of small kitchen for Dr. Ruth Bass, a bio-chemist. "It's as precisely planned as a laboratory," said architects.

View from the dining court toward dining area and living room.
The floor planes throughout the house and garden are unified by
a spine of gray, quarry, tile; tile links entry court, living-dining
and main garden terrace (in background).

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West elevation. Living room, deck and parents' bedroom face the pool. Garrett Eckbo's landscape design introduces oval swimming pool to repeat the circular shape of the brick fireplace.



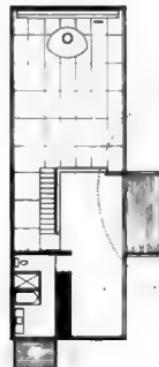
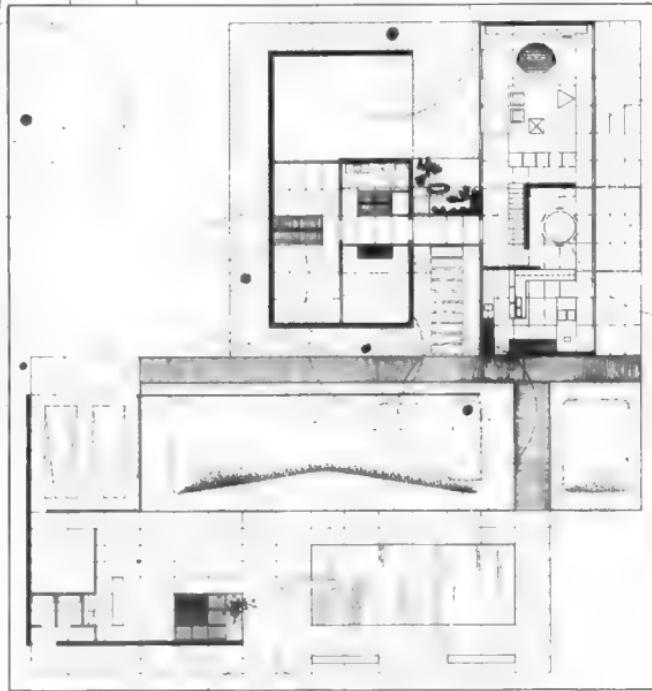
West elevation of master bedroom wing; Dr. Bell uses bedroom as a study.

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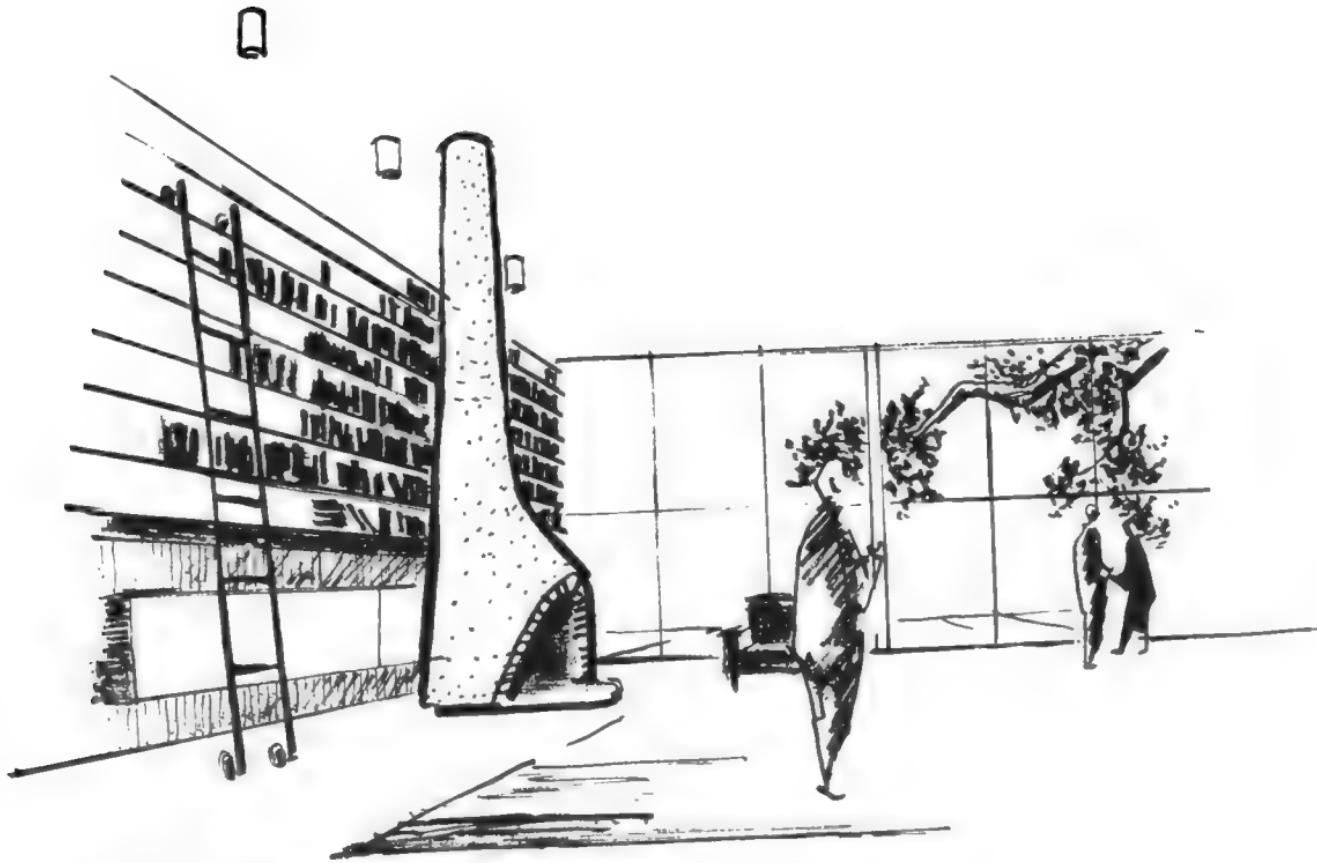


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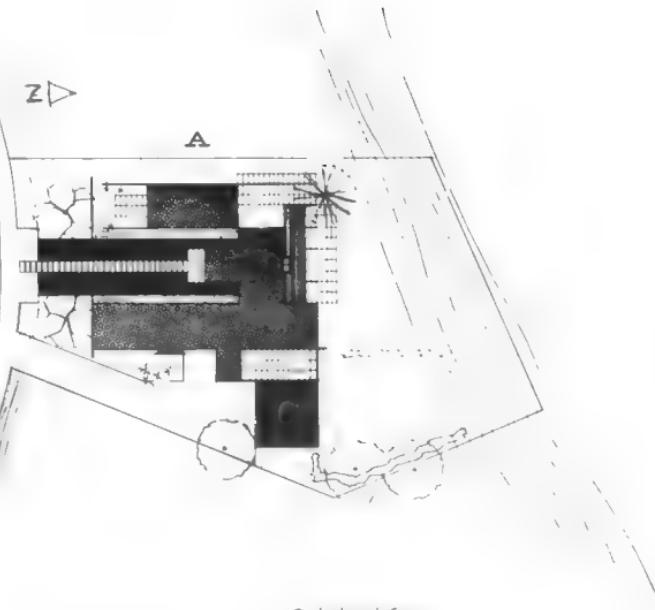
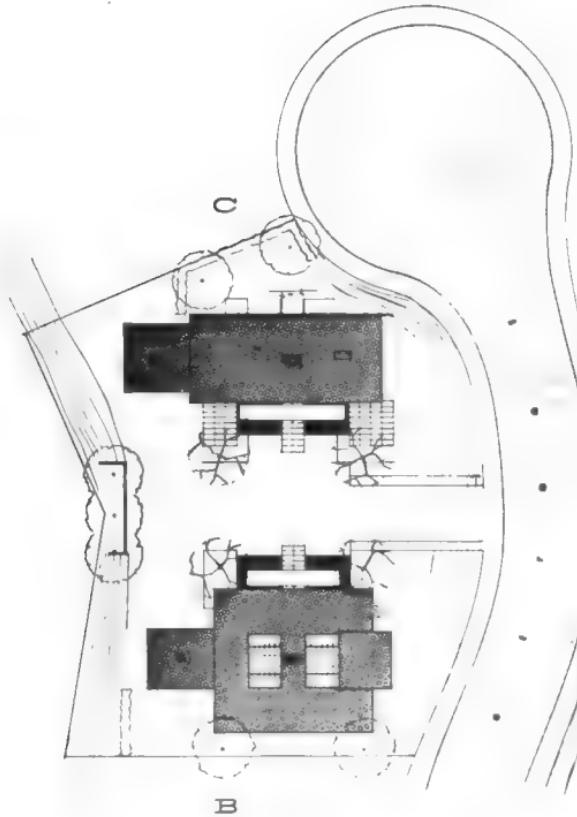




Sixteen-foot high living room has a master suite on balcony;
kitchen and dining room beneath. North wall is storage cabinets
and book cases. The room faces a paved private terrace on the
east.

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Architects: Killingsworth, Brady and Smith

Triad Development, Rue de Anne, La Jolla

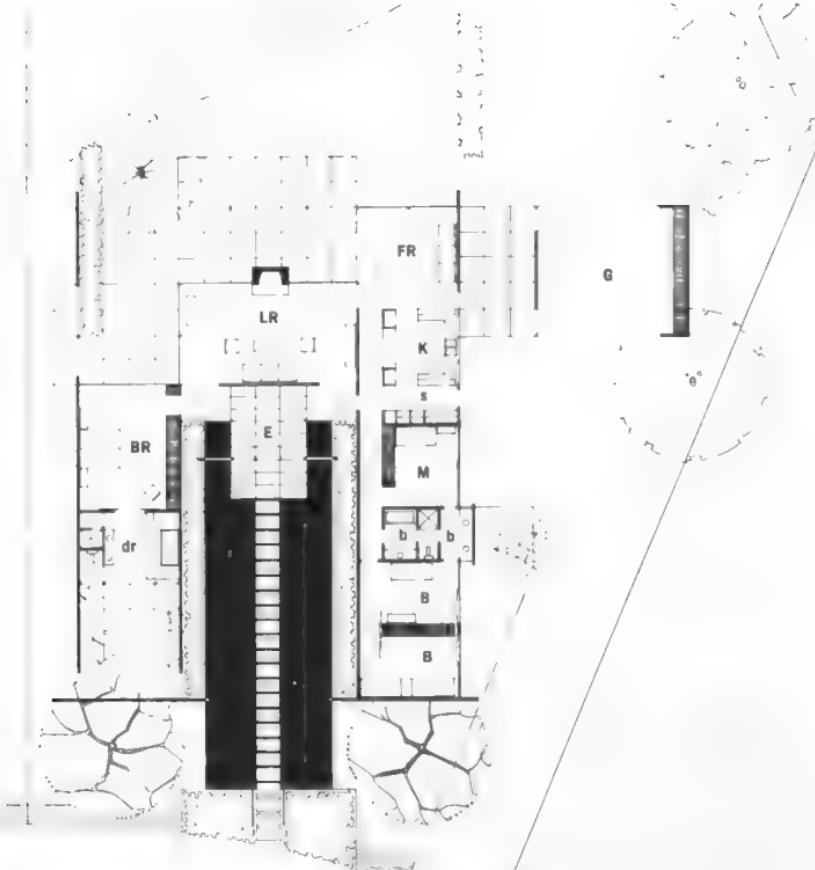
House A:

Size of lot: $\frac{1}{3}$ acre

Size of house: 2729 square feet

One story; 8 rooms: living room, family room-kitchen, 4 bedrooms,
2 baths

Material: resawn redwood vertical boarding; frame, wood (some
steel columns for seismic forces)



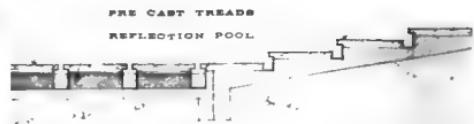
South elevation of House A. The 10-foot high entrance door is reached by white pre-cast concrete steps leading over a shallow reflecting pool.

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Entrance of House A. Flooring for the entry is the same pre-cast concrete as in walk across pool. Ceiling-height front door, floor-to-ceiling glass panels set in mastic at paving and ceiling, and absence of projections in the wall of re-sawn vertical redwood siding, account for much of distinctive quality of the work.

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View of the family room shows interrelation of family room kitchen and dining court. House A.





Master bedroom and terrace face north. Screen at end of terrace shades the sitting area from the west sun.



Off the master bath is a high-walled sunning court oriented to the south; screen has sides of bas-relief white tile; counter top is travertine.

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Architects: Killingsworth, Brady and Smith

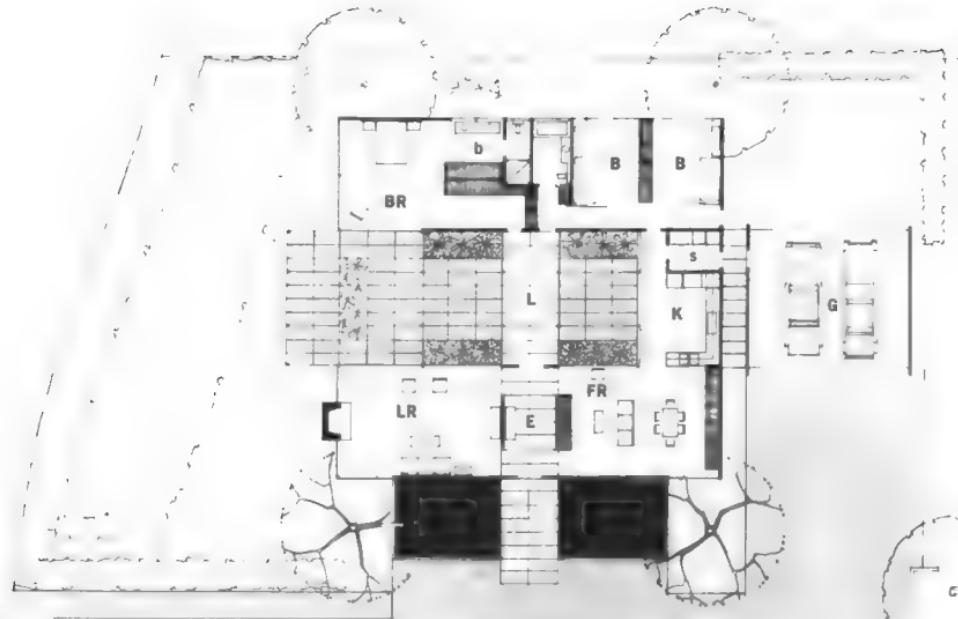
House B:

Size of lot: $\frac{1}{4}$ acre

Size of house: 2250 square feet

One story; 5 rooms: living room, family room-kitchen, 3 bedrooms,
2 baths

Material: fir boarding, wood frame (some steel columns)



House B seen from front walk of House C, which faces west. The
tracery of the trellis accentuates the entry—a pastel blue door,
the only color in the exterior of this all-white house. Space be-
tween the two houses is 70 feet.

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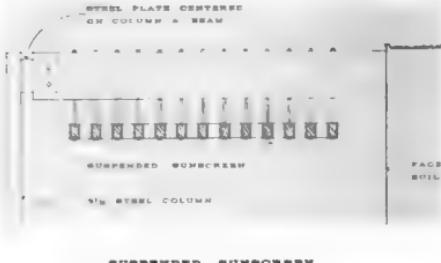
Trellis over the entrance side of House B is kept fine in detail to agree with the linear pattern of the grooved wood paneling. Column is 3½-inch square steel section; beams and screen are of fir.



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View from the kitchen through ten-foot high sliding doors toward the rear, looking seaward and the coastline beyond.





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Photograph of column detail. "Architecture is delicacy and space," believes Edward Killingsworth. An example of delicacy is the fine transition between heavy wood beam and steel post.



The living room of House B is isolated yet related to other rooms through the court system. Beyond the roofed court is

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Architects: Killingsworth, Brady and Smith

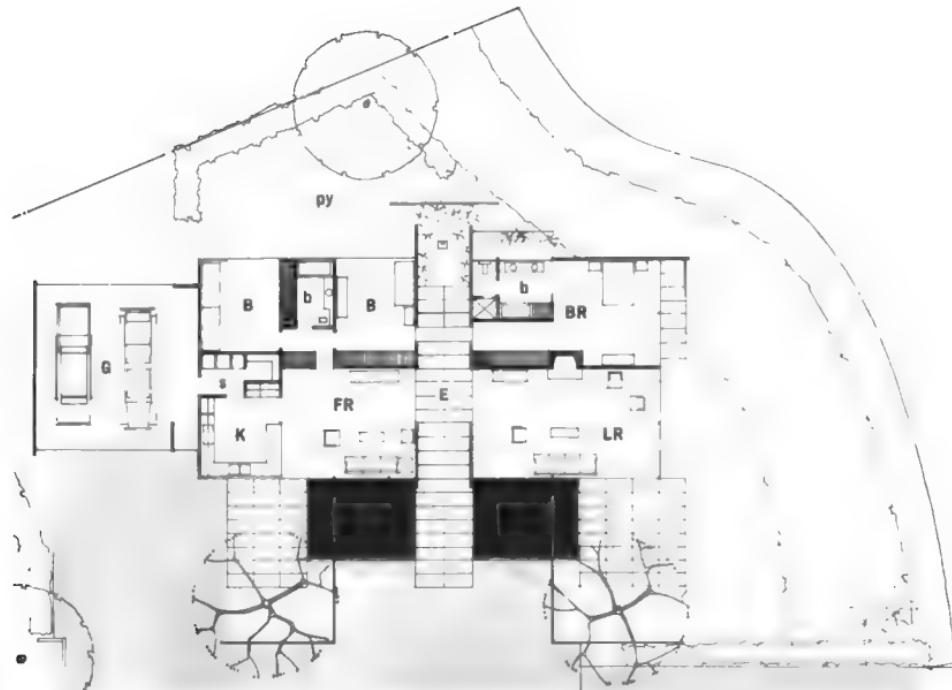
House C:

Size of lot: $\frac{1}{4}$ acre

Size of house: 2226 square feet

One story; 5 rooms: living room, family room-kitchen, 3 bedrooms,
2 baths

Material: fir boarding; wood frame (some steel columns)



House C sits well on its site—on the sculptured bank is petunia
ground cover; two matched old olive trees transplanted have
same light open character as house. Landscaping coordinated
by William Nugent.

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Courtyards on the front are enclosed with obscure glass screen set at each cantilevered steel column, with no horizontal support between.



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One of the most successful areas of the Triad is living terrace house - see this one built around olive tree.



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The interweaving of family, dining, kitchen and terrace in House C has nice logic and spontaneity.



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Glass extends from counter top to the full 10-foot ceiling height. Kitchen ceilings were furred down to 8 feet in houses A and B. Ceilings and counter tops are white, cabinets walnut plywood.

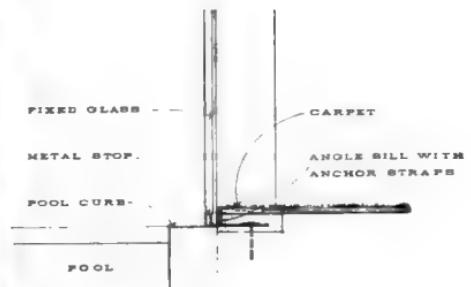
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View from the dining area toward the brick-paved hall and living room. All rooms can be reached from the central hall without crossing others.



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Living room view from across reflecting pool of entrance court.



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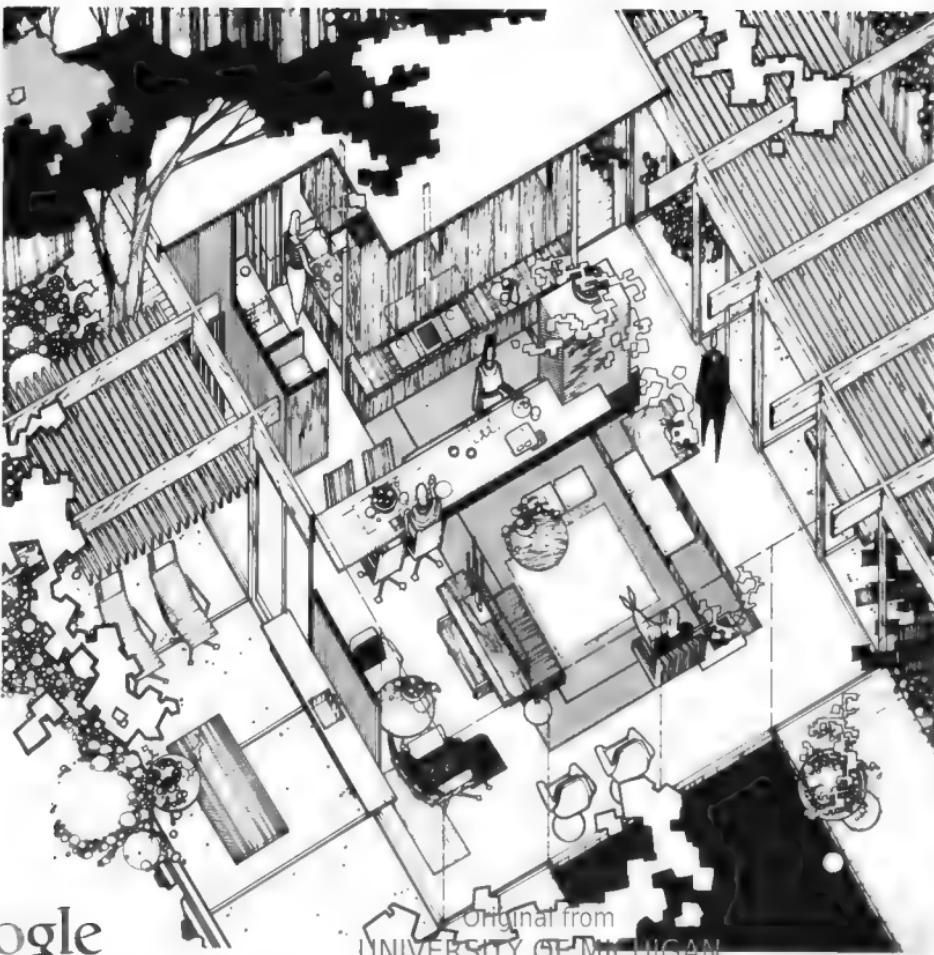
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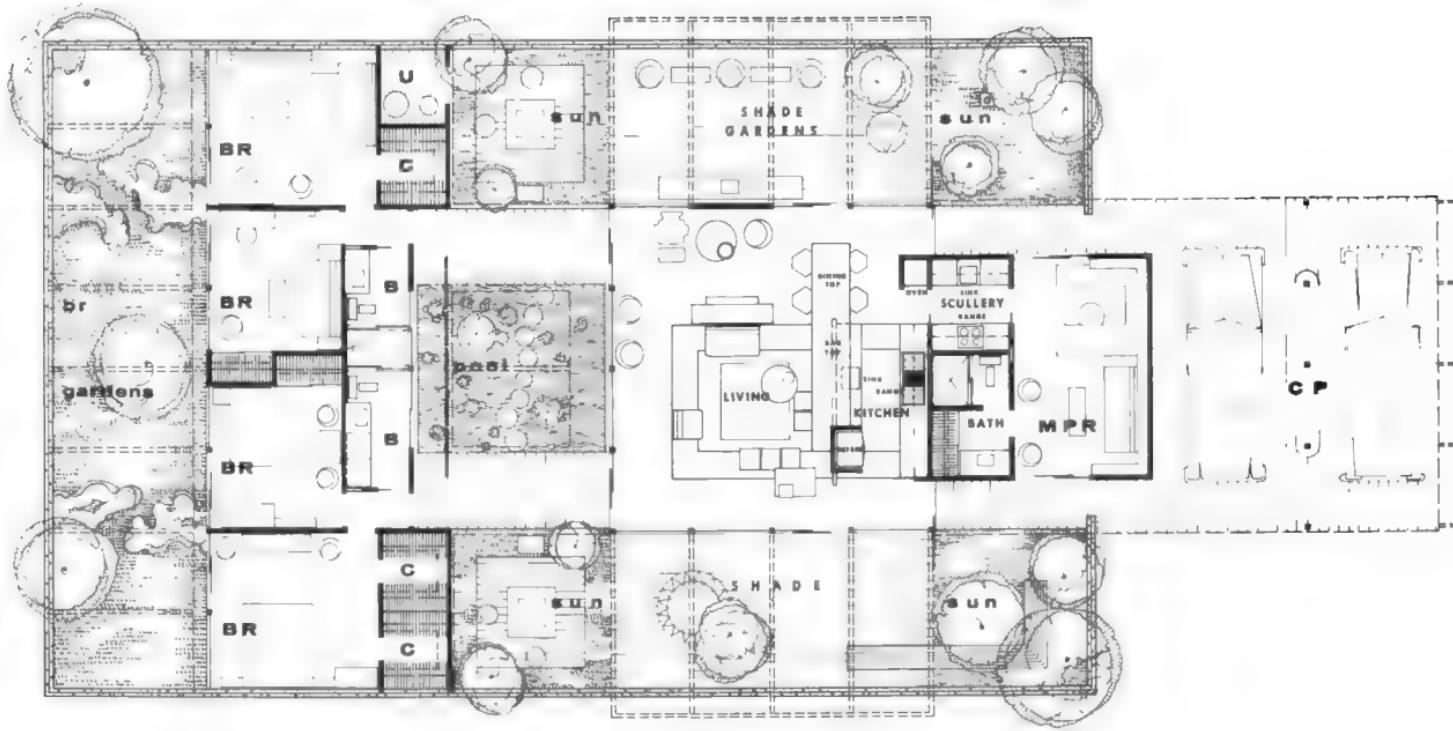
handled without bringing in a bulldozer, and existing trees can be preserved.

The first houses on the new site were started, after almost a year's delay, in the fall of 1962. For the 1750-square foot four-bedroom three-bath house, a 50- by 80-foot rectangular space is excavated, and the earth from the two-foot deep hole is stockpiled at the perimeter. Seven-foot high retaining walls are built to hold in the earth.

The bedroom wing of the house is detached from social areas by a 20-foot wide garden 50 feet long; a covered passage links the bedroom wing to the living room. Of the 4000-square foot area excavated, 2250 square feet is in gardens—sun and shade gardens, one with a 16- by 20-foot swimming pool. The living room is surrounded on three sides by outdoor living areas.

The houses are of wood post and beam construction with exterior walls of plywood panels.



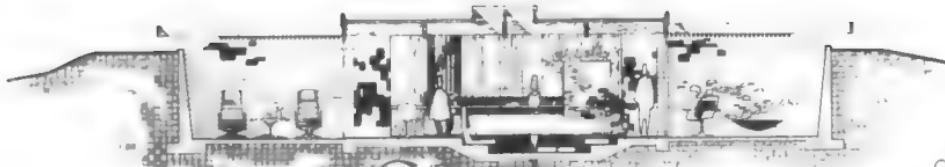
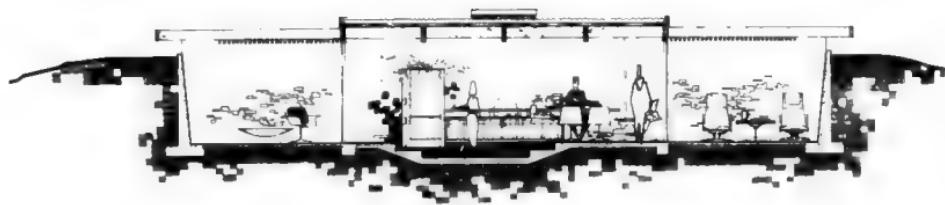


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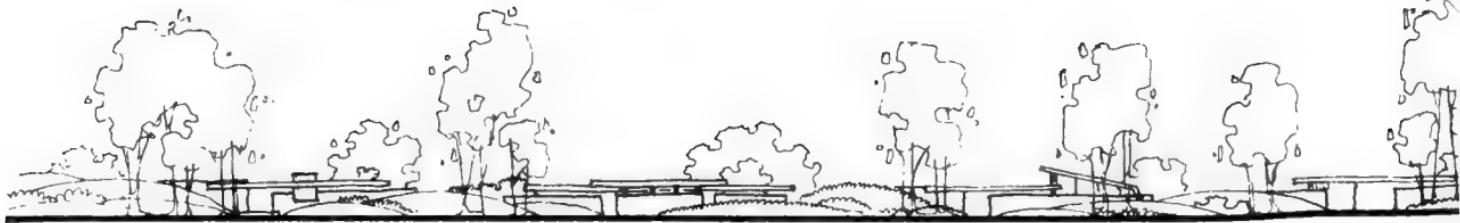
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Street elevation with carports at street level.



Two sectional views indicate finished grade line, living room with
shaded areas; gardens on two sides; sunken conversation area
in living room has skylight above. Concrete retaining walls sup-
port the earth embankment. All rooms open onto courts or gardens



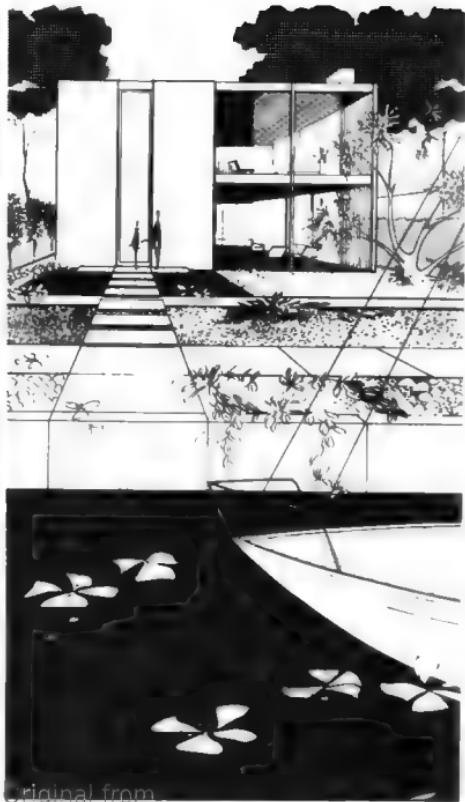
View of rear, showing earth mounded up.

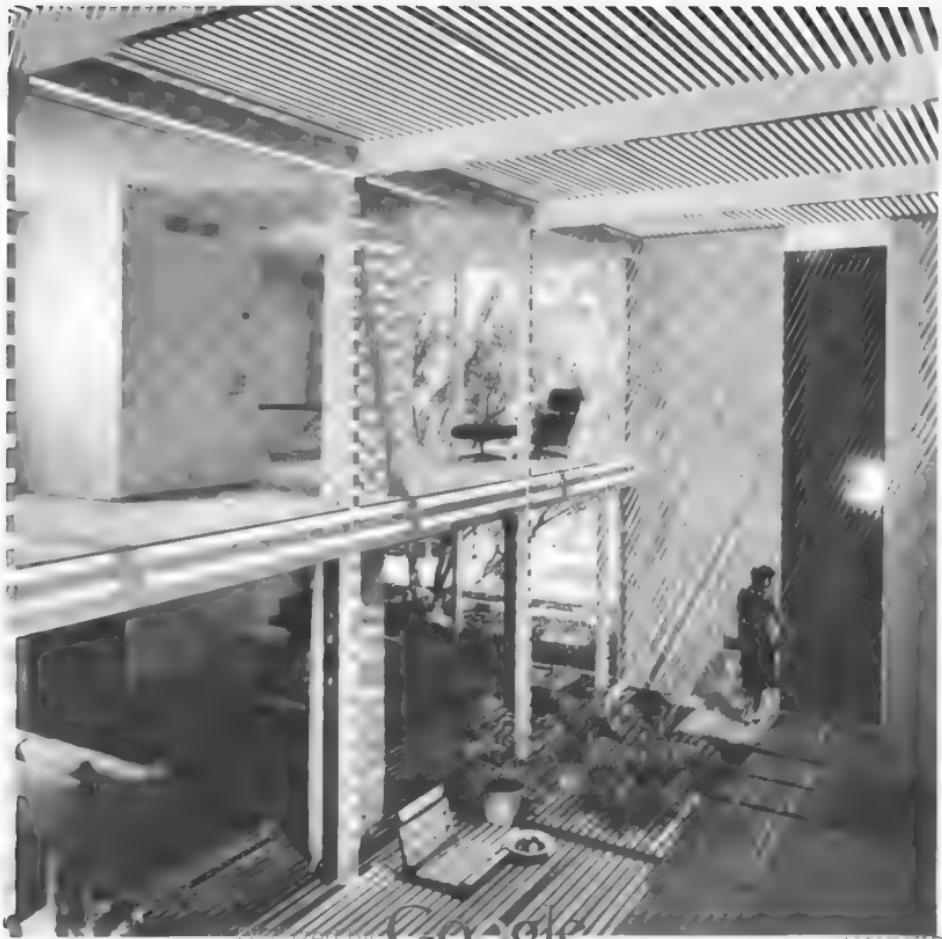


Perspective drawing. Prototype for 200 houses planned for a 140-acre tract. Houses are all below grade—a hole is cut in the earth and the house slipped in. Soil excavated is mounded up in landscape forms, to add to the continuity of the softly rolling land.

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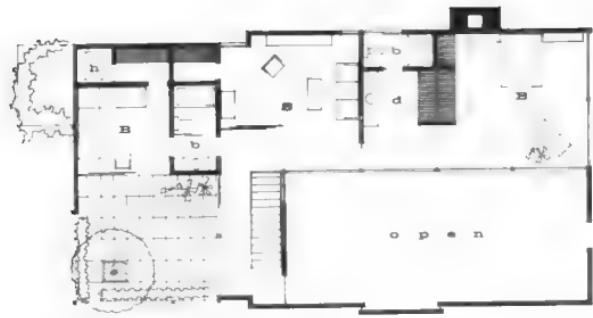




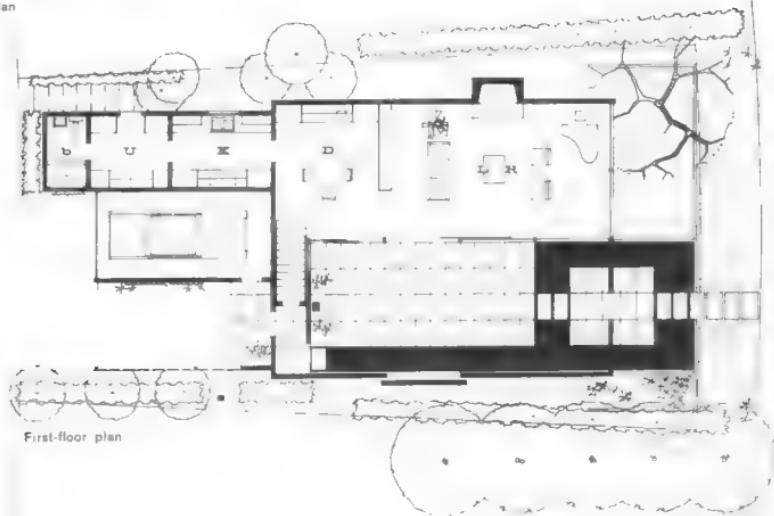
View of inner courtyard and door. The 16- by 26-foot living room extends physically and visually to take in the 15-foot wide court. The master suite and study on the second floor have glass walls looking out upon the court.

First-floor plan. The site for CSH #25 is on Rivo Alto Canal, a 40-foot wide waterway connecting with Alamitos Bay and the Pacific Ocean. The small lot varies in width from 45 feet at the canal side to 37 feet on the narrow street which provides automobile access. The lot is 80 feet deep. Setbacks on all sides reduce the buildable area to 32 by 61 feet. The area of the first floor, exclusive of terraces and garage, is 900 square feet.

Second-floor plan. In a built-up district of narrow shallow lots, it was as necessary to provide intimate views for the bedrooms as for the social areas. The master bedroom has a view of the bay, screened through the branches of an ancient olive; the porch provides an outdoor environment for the second bedroom, while the study, which can be screened off to serve as a guest room, overlooks the 15-foot high court. Enclosed area is 1100 square feet.



Second-floor plan

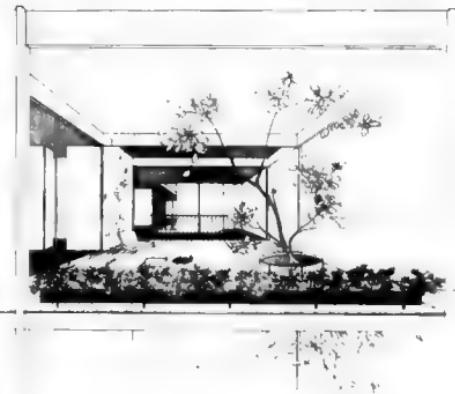


First-floor plan



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Perspective drawing. Open-roofed bedroom porch with floor of quarry tile is seen here from the street side of the house. One end opens to the interior court. The stairway leads to the dining area. A panel of plaster gives privacy to the porch.

→
Inner court looking toward street entrance. Behind 18-foot wall panel is staircase leading up to bedroom level. Sitting room is visible at upper right.

←
The street side entrance of CSH #25 is broken up into six 8- by 8-foot areas (doorways) which are shown here. Above the entrance at right is the bedroom porch.

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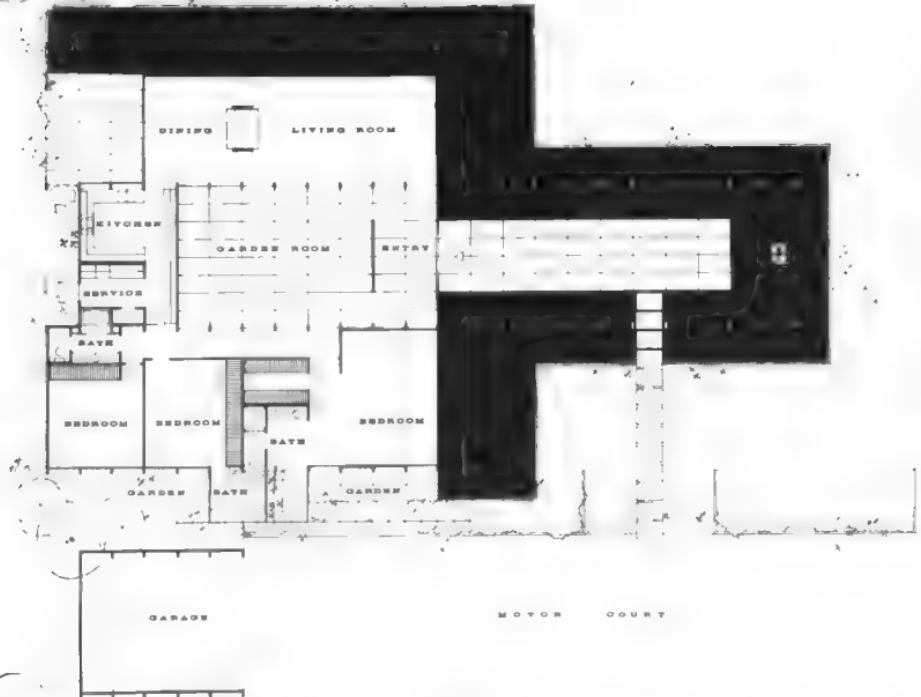


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The 3300-square foot house has 4700 square feet under roof, and the estimated cost is \$52,000. The panel houses for South America are expected to run \$6 a square foot.

"With this system it is possible to complete a custom house in record time," Killingsworth said. "The components go up like an Erector set. We expect to have it finished in two months after construction begins. The usual time for a custom house is six months."

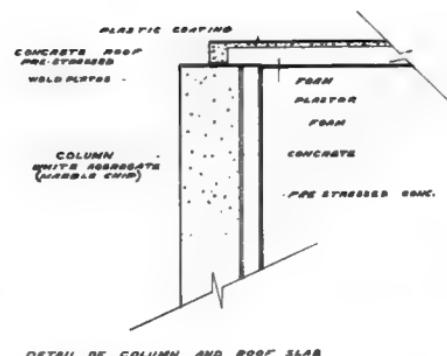
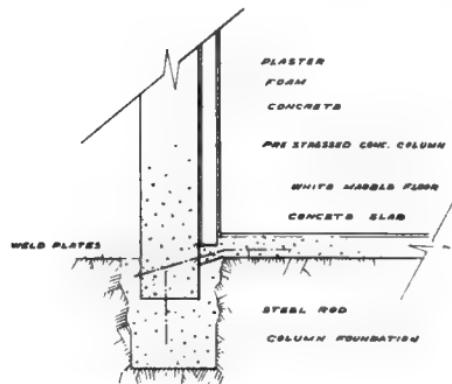
The house is approached by a pavilion surrounded by water, and 4- by 12-inch pre-stressed columns faced with white marble chips are spaced on a 20-foot grid in one direction and 5 feet in the other. The walls, indented 5 feet behind the columns, are of gray glare-resistant glass. All solid walls are of styrene-concrete panels. The pavilion, entry and garden room are paved with 1-foot squares of Mexican onyx chips ground smooth.

The core of the plan is a 20- by 25-foot garden room roofed with plastic. All spaces flow into the garden room.

Photograph of model. The architects wished to prove that a structural system developed for assembly line houses in Brazil could be made valid for a luxury house. The house, raised on a platform, is designed around court with perimeter galleries.

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DETAIL OF COLUMN AND CONCRETE SLAB



CONCLUSION



JOHN ENTENZA Born 1905, Niles, Michigan. Bachelor of Arts, University of Virginia; studied at Stanford and Tulane. Worked in the office of Secretary of Labor James J. Davis during preparatory training for the diplomatic service. Worked for two years at Metro-Goldwyn-Mayer under Paul Burns and Irving Pichel in experimental production. Editor and publisher of "Arts & Architecture" since 1938. Developed Case Study House program in 1945. Manager and later president of Plyformed Wood Co. under contract to U.S. Navy and Air Corps. Member of Governor's Council on Regional Planning. Member of California Housing Council for migratory workers. Member of the Board of Mental Health Association. Member of numerous juries on art and architectural competitions. American editor of "Zodiac." Administers Graham Foundation for fellowships in architecture and the allied arts.

Seventeen years have grayed John Entenza, but the young man who thought in 1945 that "it might be a good idea to get down to cases," has lost none of his zest for what he called "developing a point of view and doing some organized thinking which might come to a practical end . . ." His hope was that the end would be "general enough to be of practical assistance to the average American in search of a home in which he could afford to live."²²

Entenza's sense of responsibility toward the people who use architecture has not slackened since he wrote in 1945: "It becomes the obligation of all of those who serve and profit through man's wish to live well to take the mysteries and black magic out of the hard facts that go into the building of a house."

The success of the program has gone far beyond Entenza's modest hope that it would be "accepted as a sincere attempt not merely to preview, but to assist in giving some direction to the creative thinking on housing being done by good architects and good manufacturers whose joint objective is good housing."

The dialogue between architect and audience, growing out of Entenza's opening remarks, has created both an appreciation on the part of the layman for good design and a quickened understanding of the architect for his public. As the public participated more in architecture, architects were no longer merely lumped with contractor, builder or draftsman's service in the public's mind; the name and the work of each individual architect were known by laymen. And these lines of communication have remained open. Much of the credit for this must go to John Entenza.

He writes today of the Case Study program:

"At this point, one can only properly say: 'So far, so good.' At least, it has been a fruitful undertaking and, I hope, profitable for those who have participated in one or another of the many ways in which a house finally comes together.

"Our first intention, of course, was to offer the architect a maximum opportunity with a minimum of restriction; and, in most cases, I think those opportunities were rather fully realized.

"On the whole I feel that "Arts & Architecture" has been a good client. At least, a patient client, and in some cases a long suffering one.

"Certainly a great many talented people have been able to ventilate and to test a great many theories, and I feel that the Case Study House program continues to enrich the broad field of domestic architecture where the architect most often gets his most personal and important opportunities to try his talents.

"We will, where we can, continue to create the conditions and to enliven the climate in which his best efforts can be realized.

"These houses have their own unique importance but, perhaps, the richest results have been the broadening influence on the many other houses over these years that took their form and, in some way, their courage from them."

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BIOGRAPHIES



THORNTON M. ABELL

THORNTON M. ABELL Born 1908, South Haven, Michigan. Studied at the University of Michigan, University of California, and received a Bachelor of Architecture degree from the University of Southern California in 1931. Opened his own office in 1944. Taught interior design at Chouinard Art Institute, 1949 to 1952; Critic, School of Architecture, U.S.C., 1953 to date.



CHARLES EAMES

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CONRAD BUFF III Born 1928, Glendale, California. Son of Conrad Buff II, landscape painter. Bachelor of Architecture degree, University of Southern California. Chief draftsman for Paul Kingsbury; two years as designer for Clayton Baldwin. Entered partnership with Donald C. Hensman in 1947. Assistant Professor, School of Architecture, U.S.C.

CALVIN C. STRAUB Born 1921, Macon, Georgia. Studied at Texas A and M, Claremont College, University of Mexico. Bachelor of Architecture degree, University of Southern California. Project director for Arthur B. Gallion, Dean of School of Architecture, U.S.C. Private practice 1950-1956. Member of Buff, Straub and Hensman 1956-1961. Associate Professor, School of Architecture, U.S.C., 1946-1961. Professor, School of Architecture, Arizona State University, 1961.

DONALD C. HENSMAN Born 1922, Omaha, Nebraska. Bachelor of Architecture degree, University of Southern California. Designer for Langdon and Wilson. Partnership with Conrad Buff III since 1947. Critic, School of Architecture, University of Southern California.

CHARLES EAMES Born 1907, St. Louis, Missouri. Studied architecture at Washington University for two years. Studied and taught at Cranbrook Academy of Art. In association with Eero Saarinen won first two prizes in furniture competition conducted by Museum of Modern Art, 1940. Most of his activities have been in the field of industrial design and film making, in association with wife, Ray.

EERO SAARINEN Born 1910, Kirkkonummi, Finland. Came to the United States in 1923 when his father, Eliel Saarinen, was commissioned to design the Cranbrook Academy campus. Studied sculpture in Paris. Degree of Bachelor of Fine Arts, Yale University School of Architecture, 1934. Traveled in Europe from 1934 to 1936 on a Matcham Fellowship. Went into partnership with his father. After the elder Saarinen's death, Eero continued the practice alone in Birmingham, Michigan. Died 1961.



CONRAD BUFF III CALVIN C. STRAUB DONALD C. HENSMAN



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J. R. DAVIDSON



DON R. KNORR



A. QUINCY JONES

FREDERICK E. EMMONS
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J. R. DAVIDSON Born 1888, Berlin, Germany. Studied in Germany, England and France. Opened own office in Berlin, 1919. Came to United States in 1923. Established practice in Los Angeles in 1926. Instructor in Architecture at Art Center School and Chouinard Art School in Los Angeles. Cited by Royal Institute of British Architects for design of hotel interiors, 1937.

A. QUINCY JONES Born 1913, Kansas City, Missouri. Bachelor of Architecture degree, University of Washington. Opened his own office in 1945. The firm of Smith, Jones and Contini was formed in 1948. Went into partnership with Frederick E. Emmons in 1950. Visiting Critic and Lecturer in the School of Architecture, University of Southern California, since 1952. Fellow of American Institute of Architects.

FREDERICK E. EMMONS Born 1907, Olean, New York. Bachelor of Architecture degree, Cornell University, 1929. Office of Allen Siple, Los Angeles. Partnership with A. Quincy Jones since 1950. Visiting Critic, Cornell University, 1959.

DON R. KNORR Born 1927. Bachelor of Architecture degree, University of Illinois, 1947. Postgraduate work at Cranbrook Academy of Art, 1948. Opened practice in architecture and interior design in 1949. Three years as project manager with Skidmore, Owings and Merrill, San Francisco. Two years as designer with Eero Saarinen. Member of faculty of Department of Architecture, University of Illinois. The office of Knorr and Elliott was established in San Francisco in 1957.

EDWARD A. KILLINGSWORTH Born 1917, Taft, California. Bachelor of Architecture degree, Cum Laude, University of Southern California, 1940. Firm of Killingsworth, Brady and Smith formed in 1953. São Paulo Biennial Medal, 1961. Among his numerous awards are four for the Case Study Triad: two A.I.A.—Western Homes Awards, for House A and House C; National A.I.A.—House & Home Award of Merit for the Triad; and a National A.I.A. Honorable Mention for House A.

JULES BRADY Born 1908, Long Beach, California. Bachelor of Architecture degrees, University of Southern California, 1940. Designer, city and regional planner for cities of Honolulu and Long Beach. Partnership with Killingsworth and Smith formed in 1953.

WAUGH SMITH Born 1917, California. Bachelor of Architecture degree, Cum Laude, University of California, Berkeley, 1940. Design of heavy construction for Standard Oil in Java before formation of firm Killingsworth, Brady and Smith in 1953.



WAUGH SMITH



JULES BRADY



EDWARD A. KILLINGSWORTH

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PIERRE KOENIG

PIERRE KOENIG Born 1925, San Francisco, California. Bachelor of Architecture degree, University of Southern California, 1952. Several months in office of Raphael Soriano. Office of Jones and Emmons. Designed his first steel-framed house in 1950 while a student. Opened own practice 1954. Awards: Homes for Better Living, 1957; São Paulo IV International Exhibition of Architecture, 1957; A.I.A.—Western Homes Award of Honor, 1959, A.I.A.—House & Home Award, 1960. On faculty of School of Architecture, U.S.C.



RICHARD NEUTRA

KEMPER NOMLAND, JR. Born 1919, Buxton, North Dakota. Bachelor of Architecture degree, Columbia University, 1946. Worked in a number of architectural offices in New York, Seattle and Los Angeles. Opened his own office in Los Angeles in 1948. Served as a Commissioner on the Los Angeles Board of Building and Safety.



KEMPER NOMLAND

KEMPER NOMLAND, JR.

RICHARD NEUTRA Born 1892, Vienna, Austria. Graduated 1917 with honors from Technische Hochschule, Vienna. Office of Eric Mendelsohn, Berlin. Came to United States in 1923. Office of Holabird and Root, Chicago, 1924. Opened practice in Los Angeles in 1926. Member and then chairman of the California State Planning Board, 1939 to 1941. Partnership with Robert E. Alexander from 1949 to 1959. Consultant and architect to Civil Government of Guam, 1951. Fellow of the American Institute of Architects. Among his numerous honors and awards was an A.I.A. citation for his 1948 Case Study House.



RALPH RAPSON

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RALPH RAPSON Born 1915, Alma, Michigan. Spent two years in Alma College, three years in College of Architecture, University of Michigan. Received a scholarship to Cranbrook Academy of Art and studied architecture and planning under Eliel Saarinen. Worked in Chicago with Paul Schweikher, George Fred Keck and Laszlo Moholy-Nagy. While with Foreign Buildings Operations of Department of State he was co-designer of U.S. Embassy offices in Stockholm and Copenhagen. For four years head of Architectural Department of the Institute of Design in Chicago. He is the Director of the School of Architecture at the University of Minnesota.

RAPHAEL S. SORIANO Born 1907, Island of Rhodes. College of St. John, French School in Rhodes. Came to the United States, 1924. U.S. citizenship, 1930. Bachelor of Architecture degree, University of Southern California, 1934. Several months employment with Richard Neutra. Critic and guest lecturer at University of Southern California, Yale, other universities. In private practice since 1936, pioneering the development of housing in steel construction. Moved his office from Los Angeles to Tiburon, near San Francisco, in 1963.



RAPHAEL S. SORIANO

WHITNEY R. SMITH Born 1911, Pasadena, California. Bachelor of Architecture degree, University of Southern California, 1934. Staff of Farm Security Administration. Smith, Jones and Contini joined in partnership in 1948. In 1949 formed his present partnership with Wayne R. Williams. Instructor in Advanced Planning and Architecture at U.S.C., 1941 to 1942. Instructor in Architecture and Planning at Scripps College, 1947 to 1962. Past member of the South Pasadena Planning Commission. Advisory Board of U.S.C. School of Architecture. Fellow of the American Institute of Architects.



WHITNEY R. SMITH

SUMNER SPAULDING Born 1892, Ionia, Michigan. Attended University of Michigan, 1911-1913. Bachelor of Arts degree, Massachusetts Institute of Technology, 1916. Traveled and studied in Europe and Mexico. Worked in office of Myron Hunt, Pasadena. Partnership in firm of Weber, Staunton and Spaulding, later in firm of Spaulding, Rex and DeSwarte. Taught architecture at U.S.C. and Scripps College. Chairman of the A.I.A. Committee for design of Los Angeles Civic Center. Fellow in the American Institute of Architects. Died 1952.



SUMNER SPAULDING

JOHN REX Born 1923, Macon, Georgia. Bachelor of Architecture degree, University of Southern California, 1932. Traveled in Europe. Went into the office of Sumner Spaulding as a draftsman, later became an associate and finally a member of the firm Spaulding, Rex and DeSwarte. After the death of Spaulding he went into partnership with Douglas Honnold. Fifth year critic at U.S.C. and on the faculty of the School of Engineering, University of California at Los Angeles. Chairman of the Board of Zoning Appeals for the City of Los Angeles. Fellow in the American Institute of Architects.



JOHN REX

RODNEY WALKER Born 1910, Salt Lake City, Utah. Two years of engineering at Pasadena City College; three years at University of California at Los Angeles studying art and mechanic arts, graduated 1938. Draftsman in office of R. M. Schindler, 1938. Has been designing and building on his own since 1939, except for the war years, spent in the Engineering Department at Douglas Aircraft Co. Moved to Ojai Valley in 1956 where he works as designer and builder and in the field of planning and development.



WILLIAM WILSON WURSTER



THEODORE C. BERNARDI

WILLIAM WILSON WURSTER Born 1896, Stockton, California. Bachelor of Architecture degree, University of California, 1919. After a year of foreign travel, he worked in the office of Delano and Aldrich in New York, offices in San Francisco, and opened his own practice in 1926. In 1943 as a fellow in the Graduate School of Design at Harvard University he did special research in urbanism and planning. Dean of the School of Architecture and Planning at Massachusetts Institute of Technology, 1944 to 1950. Dean of the College of Architecture, University of California, 1950 to 1959. Now Dean of the College of Environmental Design at U.C. The office of Wurster, Bernardi and Emmons was established in 1945. Fellow of the American Institute of Architects; Fellow-of the American Academy of Arts and Sciences.



RODNEY WALKER

THEODORE C. BERNARDI Born 1903, Korcula, Yugoslavia. Graduated from College of Architecture, University of California at Berkeley, 1924. Went into office of William Wilson Wurster 1936. Undertook government housing projects with other associates during the war years, returning in 1944 to the Wurster firm as a partner. Lecturer University of California since 1954. Member San Francisco Planning and Urban Renewal Association. The firm is now Wurster, Bernardi and Emmons.



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CRAIG ELLWOOD

